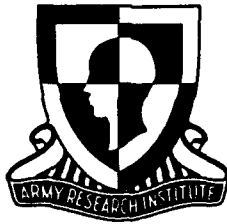AD-A250 699

Research Product 92-02

SIMNET Unit Performance Assessment System (UPAS) User's Guide

DTIC
SELECTE
MAY 2 1 1992
S   D

92-13418

April 1992

Field Unit at Orlando, Florida
Training Systems Research Division

U.S. Army Research Institute for the Behavioral and Social Sciences

92 5 19 084

U.S. ARMY RESEARCH INSTITUTE

FOR THE BEHAVIORAL AND SOCIAL SCIENCES

A Field Operating Agency Under the Jurisdiction
of the Deputy Chief of Staff for Personnel

EDGAR M. JOHNSON
Technical Director

MICHAEL D. SHALER
COL, AR
Commanding

NOTICES

REPORT DOCUMENTATION PAGE

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	1992, April	Final Report May 90 – Oct 91

4. TITLE AND SUBTITLE	5. FUNDING NUMBERS
SIMNET Unit Performance Assessment System (UPAS) User's Guide	N61339-90-C-0084 63007A 795 3204 H1/C7

6. AUTHOR(S)
Meliza, Larry L. (ARI); Tan, Seng C. (Univ. of Central Florida, Institute for Simulation and Training); White, Steve; Gross, Wayne; McMeel, Kitti (Perceptronics)

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)	8. PERFORMING ORGANIZATION REPORT NUMBER
U.S. Army Research Institute Orlando Field Unit ATTN: PERI-IF 12350 Research Parkway Orlando, FL 32826-3276	ARI Research Product 92-02

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSORING/MONITORING AGENCY REPORT NUMBER
U.S. Army Research Institute for the Behavioral and Social Sciences 5001 Eisenhower Avenue, Alexandria, VA 22333-5600	--

11. SUPPLEMENTARY NOTES
This report is based in part on work performed by the Institute for Simulation and Training, University of Central Florida, and Perceptronics. Contracting Officer's Representative, Larry L. Meliza

12a. DISTRIBUTION/AVAILABILITY STATEMENT	12b. DISTRIBUTION CODE
Approved for public release; distribution is unlimited.	--

13. ABSTRACT (Maximum 200 words)

The networking of combat vehicle simulators in SIMNET is a method of collective training that supplements field exercises. This report offers guidance for using the PC-based Unit Performance Assessment System (UPAS) to collect and analyze data from SIMNET exercises.

The UPAS collects network data on vehicle status and firing events during exercises and loads these data into a relational database at the end of the exercise. It contains menus of graph and tables that can be used to analyze unit performance. In addition, it contains graphic aids that inegrate network data with unit planning information and terrain data to provide a complete description of unit performance.

The UPAS can be used to analyze unit performance after an exercise and aid the trainer in identifying exercise events that contributed substantially to exercise outcomes. Using SIMNET capabilities (for "bird's eye" and "out the window" views) or displays within the UPAS, events can be illustrated as units receive feedback during After-Action Reviews (AARs).

14. SUBJECT TERMS		15. NUMBER OF PAGES
SIMNET Data integration Collective training Unit performance measurement After-action review (AAR)		86
		16. PRICE CODE --

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	Unlimited

SIMNET Unit Performance Assessment System (UPAS) User's Guide

Larry L. Meliza
U.S. Army Research Institute

Seng Chong Tan
University of Central Florida
Institute for Simulation and Training

Steve White, Wayne Gross, and Kitti McMeel
Perceptronics

Field Unit at Orlando, Florida
Stephen L. Goldberg, Chief

Training Systems Research Division
Jack H. Hiller, Director

April 1992

The networking of combat vehicle simulators, as illustrated by SIMNET, provides a method for collective training that supplements field exercises with operational equipment. The capability of SIMNET to replay portions of the exercise from a "bird's-eye" or "out the window" view is a valuable tool in illustrating teaching points to exercise participants during After-Action Reviews (AARs). However, SIMNET does not include analytical tools to help the trainer identify critical events that need to be illustrated during AARs. Such analytical tools might also be used to facilitate training research in the SIMNET environment.

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) developed a PC-based Unit Performance Assessment System (UPAS) that collects data on vehicle status and firing events broadcast over the simulation network. It loads these data into a relational database, and it contains menus of graph and table options linked to the database to support unit performance analysis. Further, the UPAS uses graphic aids that integrate network data with other sources of information (unit plans and terrain data) to provide a more complete picture of unit performance than is possible with network data alone.

This report offers guidance for trainers and researchers in using the UPAS to collect and analyze unit performance data. The work described in this report is a portion of the research task "Training Requirements for Combined Arms Simulators." This task supports a Memorandum of Agreement entitled "The Effects of Simulators and Other Resources on Training Readiness," signed 16 January 1989. Parties to this agreement are the U.S. Army Training and Doctrine Command, the U.S. Army Center at Fort Knox, the U.S. Army Materiel Command, and ARI.

The UPAS, and the UPAS User's Guide, will be revised in response to user feedback. Users are encouraged to submit any suggestions for improving UPAS software or the user's guide to the first author. Comments and questions should be addressed to Chief, USARI Orlando Field Unit, 12350 Research Parkway, Orlando, Florida 32826-3276.

Accession For	
NTIS GRA&I	☑
DTIC TAB	☐
Unannounced	☐
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or Special

EDGAR M. JOHNSON
Technical Director

v

SIMNET UNIT PERFORMANCE ASSESSMENT SYSTEM (UPAS) USER'S GUIDE

CONTENTS

CONTENTS (Continued)

LIST OF TABLES

LIST OF FIGURES

CONTENTS (Continued)

CONTENTS (Continued)

CONTENTS (Continued)

CONTENTS (Continued)

SIMNET UNIT PERFORMANCE ASSESSMENT SYSTEM (UPAS)
USER'S GUIDE

Introduction to the UPAS

Simulation Networking (SIMNET) is a method of collective training that supplements field training exercises with operational equipment. Each simulator in the network simulates a vehicle or aircraft in the battlefield environment. Simulators broadcast their position, status, and other pertinent information over the network. The image generator for each simulator is capable of displaying the terrain on which the battle is conducted and all participants in the exercise.

SIMNET is intended to help train crews to fight together as part of a unit and units to fight together as part of a larger organization. The Unit Performance Assessment System (UPAS) is a PC-based system developed to assist trainers and training researchers in analyzing unit performance. The UPAS was designed to

- collect virtually all of the data broadcast over the network (vehicle location, vehicle status, and firing events);

- filter and organize the data to support rapid analysis;

- load data into a relational database patterned after the National Training Center (NTC) database;

- integrate broadcast data with unit planning data and terrain data; and

- provide graphic and tabular displays of data to support unit performance analysis and performance feedback.

After data are collected from the networked simulators, the UPAS serves as a stand alone tool. It can be used immediately after an exercise to support After Action Reviews (AARs), and it can be used subsequently to support training needs analysis and research.

UPAS After Action Review Aids

The goal of the UPAS is to help trainers to identify and illustrate key exercise events quickly after an exercise. UPAS displays information in a way that supports quick interpretation by a trainer or researcher, and, at the same time, provides animated figures, static figures, and tables that can be used to illustrate key training points to exercise participants. The information displays include a Plan View Display, a Battle Flow Chart, Battle Snapshots, an Exercise Timeline, graphs, and tables. Each of these types of displays is described below.

1

The Plan View Display replays the battle or selected segments of a battle. As Figure 1 illustrates, the Plan View shows a bird's eye view over a grid map displaying selected terrain features and unit control measures from the unit's operations order. Terrain features are color coded in the UPAS display, and these features include treelines, rivers, dirt roads, highways, and buildings. Control measures are displayed in yellow, and the name of each measure is included with its display. The icons representing vehicles include an accurate display of gun tube orientation, and these icons change colors to indicate when a vehicle fires and when it is destroyed.

The Plan View includes options that allow you to move quickly forward and backward to specific points in an exercise to examine critical aspects of unit performance. For example, if you wanted to find out if a unit quickly returned fire and moved to covered and concealed positions when fired upon by the enemy, you could use the replay to serve this purpose. Further, the Plan View allows you to magnify portions of the battlefield of particular interest to you and print a hard copy of the action at any point in the battle that you may choose. Such hard copies can be used with an overhead projector to illustrate key points during AARS.
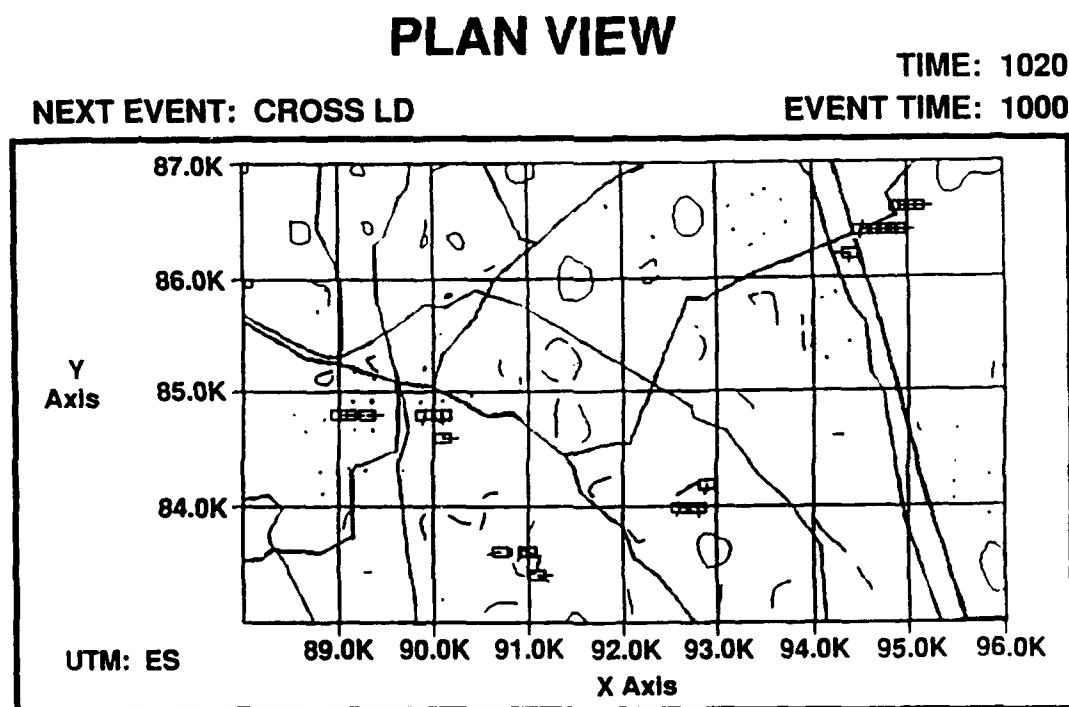
Figure 1. Example of a Plan View Display screen that shows a replay of an exercise from a bird's-eye view.

A Battle Flow Chart is an animated figure that traces the movement of vehicles and units throughout the course of a mission or during critical segments of a mission. Movement is traced over a grid map that includes the control measures for a particular mission and major terrain features (Figure 2). UPAS allows you to control the points in time covered by a particular trace so that you can focus attention on a specific part of a mission. The Battle Flow also allows you to specify the time interval at which vehicle positions are to be marked. This important feature allows you to adjust the position updates to, for example, avoid data clutter for exercises that are long or involve a large number of vehicles. As in the case of the Plan View, the Battle Flow also allows you to magnify portions of the battlefield of particular interest and print copies of screens.

The Battle Flow provides a picture of a unit's overall movement for use in assessing how effectively it navigated towards the objective, applied movement techniques like bounding overwatch, and followed control measures. For example, you could use a Battle Flow of the entire exercise to find out if a unit crossed each of its control measures by the time specified in the operations order.

BATTLE FLOWS

DATE: 91-8-21   **START TIME: 1650**   **FINAL TIME: 1708**
EXERCISE ID: 001   **COMPANY: A**   **PLATOON: 1**
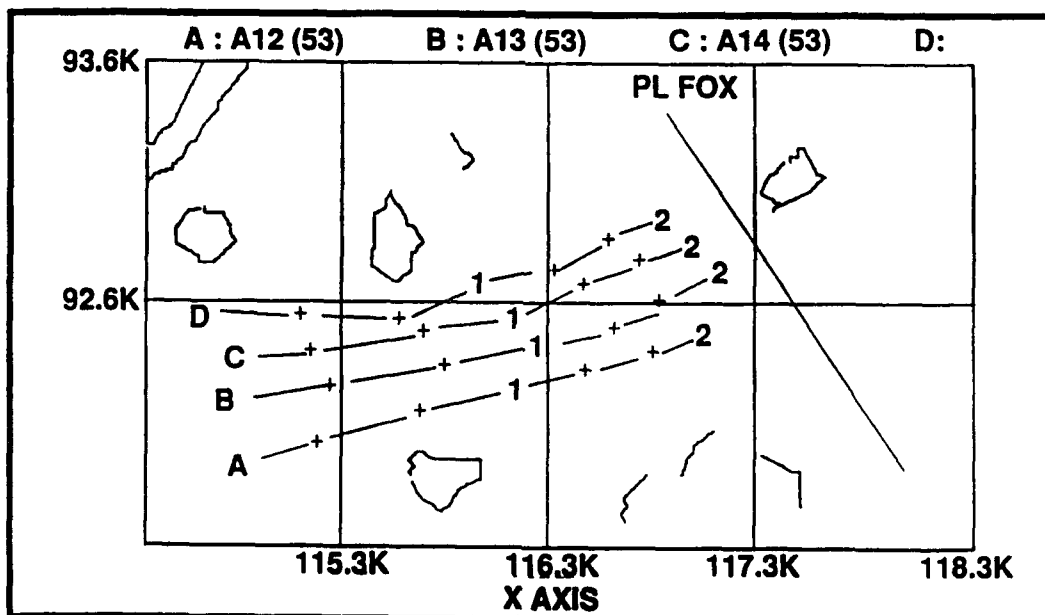
Figure 2. Battle Flow Chart tracing movement of vehicles during a critical segment of an exercise.

Battle Snapshots (see Figure 3) are figures that show the position of vehicles and their gun tube orientation at specific points in a mission. Positions are displayed over a grid map with unit control measures and major terrain features. You can select the points during a mission for which Snapshots are to be prepared to examine unit performance or to illustrate a critical point during an AAR. For example, you might want a graphic showing that a unit is two kilometers away from a phase line at the time it is supposed to be crossing the phase line. You also have the option of magnifying the battlefield for a Snapshot and printing hard copies, just as you do with the Plan View and the Battle Flow Chart.

BATTLE SNAPSHOT

DATE: 91-8-21   TIME: 1658
EXERCISE ID: 001   COMPANY: A   PLATOON: 1
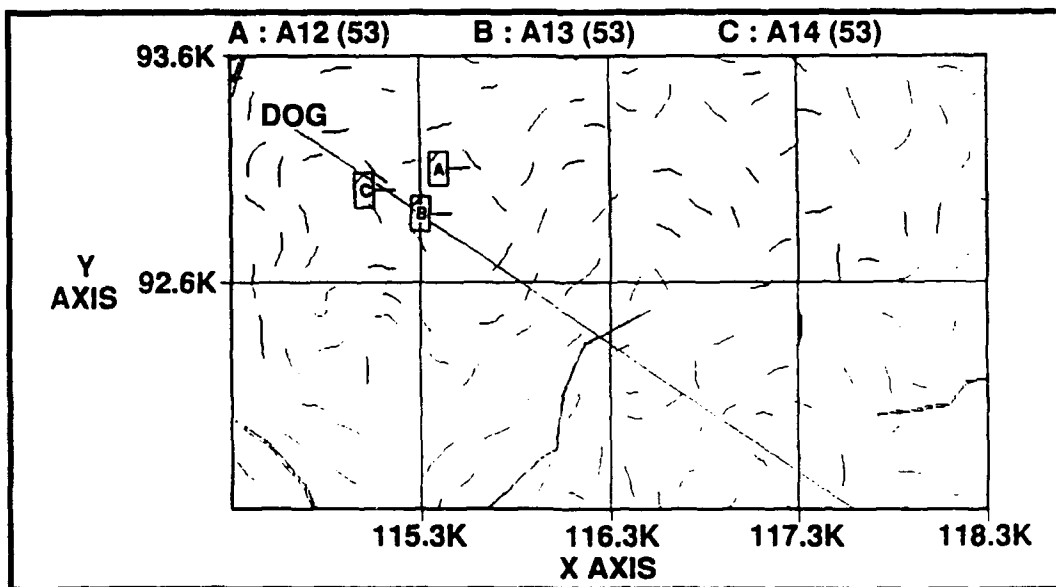
Figure 3. Example of a Battle Snapshot.

4

An Exercise Timeline is a figure that describes events as a function of time (see Figure 4). The intent of the Timeline is to describe events in a way which makes it easy for you to see how well a unit coordinates movement and weapons employment with each other and with other tactical events. If a communications log is kept by an observer during a SIMNET exercise, the time and content of messages can also be related to movement and firing events shown on the Timeline. The Timeline may help you to identify key time segments or points in time for more detailed examination using a Battle Flow Chart or Battle Snapshot.

SIMNET EXERCISE TIMELINE

LEGEND:

■ TIME BETWEEN FIRST AND LAST VEHICLE CROSSING THE CONTROL MEASURE

◄─► TIME DURING WHICH NO VEHICLE MOVED   ↑ FIRST FRIENDLY FIRE DELIVERED

☐ ARTILLERY FIRE NEAR UNIT   X ENEMY VEHICLE DESTROYED

↓ FIRST ENEMY FIRE RECEIVED   O FRIENDLY VEHICLE DESTROYED

Figure 4. Example of an Exercise Timeline.
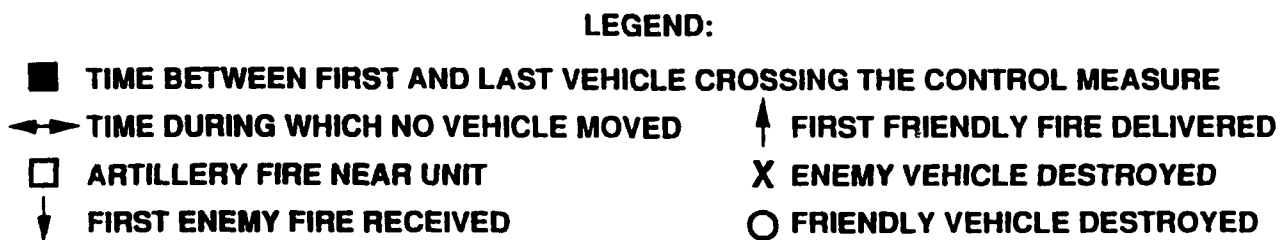
5

By loading network data into a relational database management system, UPAS makes it possible for even non-programmers to examine these data quickly using Structured Query Language (SQL). To further assist users, menus of graph and table options have been included in the UPAS that can be used without knowing SQL. Figure 5 is an example of a graph that can be generated using the graph menu, and Figure 6 is an example of one of the tables that can be created using the table menu.

Vehicles Hit by Firing Side over Time
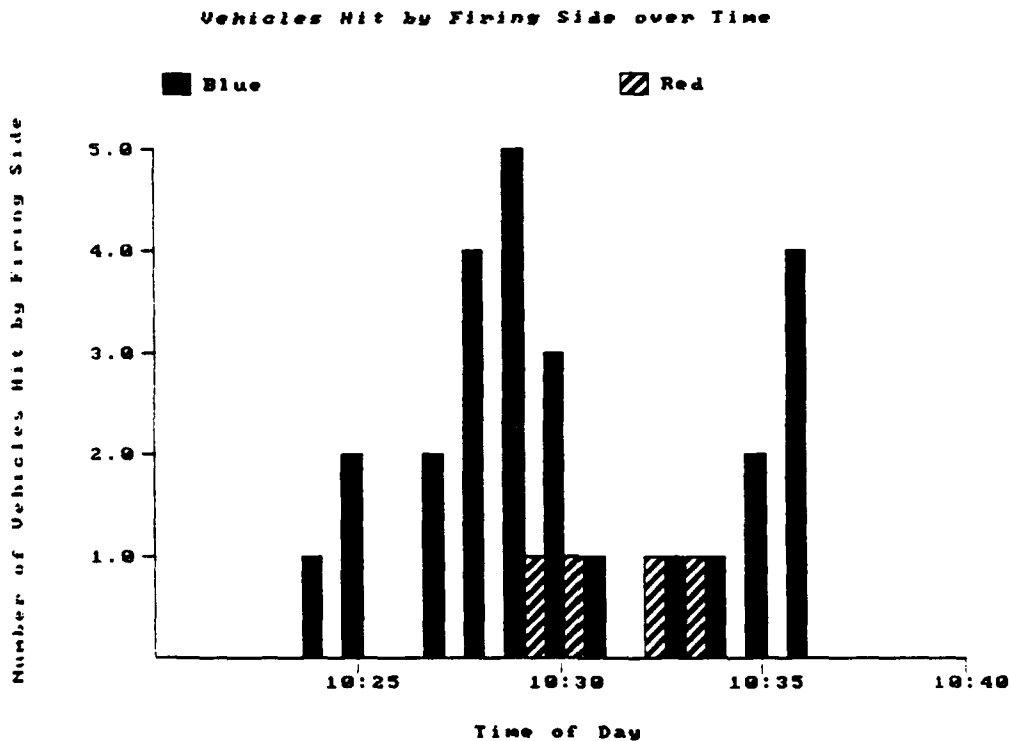
Figure 5. Example of a graph produced using the UPAS.

6

```
┌────────────────────────────────────────────────────┐
│ PAIRED BLUFOR FIRING EVENTS                          │
│                                                      │
│ TIME        TARGET BUMPER #  FIRING BUMPER #   RESULT│
│ ┌──────────┬─────────────┬───────────────┬──────────┐│
│ │10:25:00  │ 342 (53)    │ A43 (53)      │    M     ││
│ │10:25:00  │ 342 (53)    │ A44 (53)      │    H     ││
│ │10:26:00  │ 311 (53)    │ A44 (53)      │    H     ││
│ │10:26:00  │ 312 (53)    │ A43 (53)      │    M     ││
│ │10:27:00  │ 313 (53)    │ A44 (53)      │    M     ││
│ │10:28:00  │ 311 (53)    │ A22 (53)      │    K     ││
│ └──────────┴─────────────┴───────────────┴──────────┘│
│                                                      │
│ Use Arrow Keys to scroll data.                       │
│ F1 to print table.                                   │
│                                                      │
│ <Esc> to Exit Display Mode.                          │
└────────────────────────────────────────────────────┘
```

Figure 6. Screen showing a table created using the UPAS.

Purpose and Organization of User's Guide

This guide is designed to meet the information needs of trainers and researchers desiring to use the existing UPAS graphs, tables, and other AAR aids to examine unit performance. Users wanting to modify the UPAS graphs and table options or perform additional analyses using the data in the SIMNET/NTC database are referred to the Advanced User's Guide for the Unit Performance Assessment System.

The text of this guide assumes that UPAS hardware and software have already been installed on your computer and your computer has been linked to the SIMNET network. If this is not the case, see Appendix A for guidance.

This guide is organized according to the UPAS Main Menu. To reach the main menu, change the directory of your computer to the "UPM" directory (type CD UPM), and then type "UPM" to initiate the UPAS program. The first screen you see will be the UPAS title screen. Press the carriage return key to move to the UPAS Main Menu screen shown in Figure 7.

```
┌─────────────────────────────────────────────────────┐
│                                                       │
│            Unit Performance Analysis System           │
│                                                       │
├─────────────────────────────────────────────────────┤
│                                                       │
│                  Data Collection                      │
│                                                       │
│                  Data Summary                         │
│                                                       │
│                  Performance Measurement              │
│                                                       │
│                  NTC Archive Database                 │
│                                                       │
│                  Utilities                            │
│                                                       │
├─────────────────────────────────────────────────────┤
│   Use up or down arrow keys to highlight selection.   │
│   <Enter> to accept.                                  │
│   <Escape> to quit.                                   │
│                                                       │
└─────────────────────────────────────────────────────┘
```

Figure 7. The UPAS Main Menu.

     The Data Collection option will call up the menus required
to set up the UPAS to collect data from a SIMNET exercise and
load these data into a relational database. The Data Summary
option will call up the menus required to generate the graphs,
tables, and AAR aids used to examine unit performance. The
Utilities option will call up a series of menus that can be used
to load exercise data onto floppy disks or a tape drive, and it
can be used to load exercise data from these media onto your hard
drive (C drive) for purpose of analysis. The Utilities option
also allows you to modify the menus of graph and table options
available within the UPAS. The Performance Measurement option
and the NTC Archive Database options are research tools that will
be discussed briefly at the end of this guide. For more
information on these options, you are referred to the advanced
user's guide.

     If you should ever find it necessary to reboot while in
UPAS, always turn off your computer (cold boot) instead of doing
a warm boot by pressing <Ctrl>-<Alt>-<Del>. Unless you do a cold
boot, the high memory system associated with UPAS will not load
properly and UPAS will lock up when it receives a task requiring
high memory.

Collecting Data from the Simulation Network

As previously mentioned, UPAS collects virtually all of the data packets from SIMNET exercises relevant to unit performance assessment. This section is concerned with setting up the UPAS to collect data, periodically monitoring data collection, and initiating the program that automatically loads data into a relational database management system at the end of the exercise. This loading process must take place before you can use the UPAS graph and table menus.

Selecting the data collection option from the UPAS main menu will result in the screen shown in Figure 8. The first two options on the Data Collection Menu, "Set Data Path" and "Collect Data" must be addressed before the UPAS will begin to collect exercise data. The "Convert Data to NTC Format" option is employed after data have been collected from the network. The "Platoon Organization", "Master Event List", and "Control Measures" options may be used before or after data collection.

```
+------------------------------------------------------------+
|                                                            |
|                     Data Collection                        |
|                                                            |
+------------------------------------------------------------+
|                                                            |
|                    Set Data Path                           |
|                                                            |
|                    Collect Data                            |
|                                                            |
|                    Convert Data to NTC Format              |
|                                                            |
|                    Platoon Organization                    |
|                                                            |
|                    Master Event List                       |
|                                                            |
|                    Control Measures                        |
|                                                            |
+------------------------------------------------------------+
|  Use up or down arrow keys to highlight selection.         |
|  <Enter> to accept.                                        |
|   <Esc> to return to Main Menu                             |
+------------------------------------------------------------+
```

Figure 8. UPAS Data Collection Menu.

Setting the Data Path

The data collected for a SIMNET exercise may exceed fifty megabytes. Therefore, before you start to collect data for a new exercise you should make sure that you have adequate space available on your hard disk. If you need to remove previous exercise data to provide room for new data, see the directions on pages 60 through 62 for using the UPAS to back up old files.

In order to collect data from networked simulations, you must first provide information about where the data are to be stored by selecting and addressing the "Set Data Path" option. When you select this option, a screen similar to the one in Figure 9 will appear. The data path entered will ordinarily lead to a subdirectory of the UPM directory. For example, a path of "C:\UPM\KNOX" would cause data to be collected in the Knox subdirectory. The subdirectory you specify for data collection should be empty, because UPAS will not allow you to collect data into subdirectory that already contains data. For practical reasons it is advisable to use a unique subdirectory name every time that you collect data.

```
┌─────────────────────────────────────────────────────────────┐
│                                                               │
│              Path Setup for Data Collection                   │
│                                                               │
├─────────────────────────────────────────────────────────────┤
│                                                               │
│                                                               │
│                                                               │
│                                                               │
│                  Path: C:\UPM\KNOX                            │
│                                                               │
│                                                               │
│                                                               │
│                                                               │
├─────────────────────────────────────────────────────────────┤
│  Type data collection path or use arrow keys to modify        │
│  You may use up to 8 characters for each directory name.       │
│  <Enter> to accept or <Esc> to abort and return to previous menu.│
└─────────────────────────────────────────────────────────────┘
```

Figure 9. UPAS Screen for identifying data paths.

To change the current directory path, use the arrow keys to position the cursor, type in the appropriate path, and then press <Enter> to accept the path and then press <Escape> to return to the Data Collection Menu.

In addition to arrow keys, the <Backspace>, <Insert>, and
<Delete> keys can be used in editing the name of the path. If
the subdirectory you name in the path is not already present on
the hard disk (C), UPAS will prompt you to create one after you
press <Enter>. When the prompt appears, enter "Y" to create the
subdirectory with the name you entered in the path, or "N" if you
want to alter the name. A few seconds after you enter "Y" to
create a new subdirectory, UPAS will display the message
"directory created".

Setting up for Data Collection

     The Collect Data option allows you to set up the system to
collect data. The data collection process proceeds only if
previous exercise data are not in the directory you have
selected. If you select the Collect Data option and the path you
selected already contains data, your screen will display the
message shown in Figure 10. The system prompts you to decide
whether or not to save the data that is already in the
subdirectory. To save the old data, press the <Escape> key twice
to move to the UPAS Main Menu, and then select the Utilities
option from this menu. Procedures for backing up these data are
found in the next to last section of this guide.

```
+-----------------------------------------------------------------+
|                                                                 |
|                          Collect Data                           |
|                                                                 |
+-----------------------------------------------------------------+
|                                                                 |
|            +-----------------------------------------+          |
|            | Found Previous Exercise Data Files.     |          |
|            | You must save the data collected        |          |
|            | to Floppy disk or tape or you will lose it. |       |
|            +-----------------------------------------+          |
|                                                                 |
+-----------------------------------------------------------------+
|  <Esc> to access UTILITIES                                       |
|                        or                                       |
|  <Enter> to delete previous Exercise data.                      |
+-----------------------------------------------------------------+
```

Figure 10. Screen showing error message displayed when
attempting to load exercise data into a directory that is not
empty.

If you select the Collect Data option and no data are in the subdirectory, then the Data Collection Set-up screen shown in Figure 11 will appear. All of the fields on the screen must be completed before UPAS can collect data from an exercise.

The cursor will appear in the first field when this screen is displayed. The first field defaults to the current date. Unless you are setting up for data collection to be conducted in the future, it is not necessary to edit this field. Press <Enter> to move the cursor to the next field.

```
+-----------------------------------------------------------+
|                                                           |
|                 Data Collection: Set Up                   |
|                                                           |
+-----------------------------------------------------------+
|                                                           |
|   +---------------------------------------------------+   |
|   |    Exercise Control # (date):  91-6-3             |   |
|   |              Exercise ID:  001                    |   |
|   |              Mission Type:  Hasty Attack          |   |
|   |   Armor/Mech/Combined Arms:  A                    |   |
|   |              Organization:                        |   |
|   |   The following functions control the selected IDs|   |
|   |         <F2> Adding IDs                           |   |
|   |         <F3> Modifying IDs                        |   |
|   |         <F4> Viewing IDs                          |   |
|   +---------------------------------------------------+   |
|                                                           |
+-----------------------------------------------------------+
|  Type a date, then press Enter to accept.                 |
|  <F1> to start Collecting Data.  | <F2>, <F3>, and <F4> to select IDs. |
|  <Esc> to return to Data Collection Menu.                 |
+-----------------------------------------------------------+
```

Figure 11. UPAS Data Collection Setup Screen

The second field requires you to type in the Exercise ID number. This ID number is the same number used to identify the exercise on the SIMNET network, and it must be obtained from the Battle Master before the exercise starts. This ID will be a number from 1 to 999. This is the most important information to be inserted in this screen, because the UPAS cannot collect data unless the correct ID is used.

12

The third field requires you to enter the mission type. Mission type includes attack, defend, road march, etc. The specific format of this information is not critical, and as many as 20 characters may be used. After you have identified the mission type, press the <Enter> key to move to the next field. In the fourth field, you are asked to choose the type of unit (armor, mechanized infantry, or combined arms).

The fifth field asks you to enter the unit's organization. The unit's organization may be defined in any way the user wishes, using up to 20 characters.

In certain cases there will be vehicles on the network for which you do not want to collect data. For example, two different exercises may be run currently in SIMNET. The data from both exercises would be picked up by UPAS unless you designate the specific vehicles for which data are to be collected. If you are concerned about the possibility of collecting unwanted data, you can designate the vehicles on which data are to be collected. To designate that data be collected for specific vehicles press the <F2> key. A screen will then appear with a block in which you can enter the logical player numbers for the vehicles of interest, as shown in Figure 12. The logical player numbers are obtained from the Battle Master. Each of these player numbers has three parts (i.e., the site ID, the host ID, and the vehicle number) separated by a period. The sequence of numbers for one vehicle should be separated from that for other vehicles with a space. UPAS will allow you to type in up to seventy vehicle IDs. To review subsequently the list of vehicle IDs, press the <F4>. The use of this key will allow you to view, but not edit, the IDs. In order to edit the IDs after they have been saved, press the <F3> key. Note: You do not have to enter vehicle IDs unless you want to limit data collection to specific vehicles.

Initiating and Monitoring Data Collection

After filling out all of the fields in the Data Collection Setup screen, you may press the <F1> field to start the data collection process. Pressing the <F1> key will cause the Data Collection Record screen (Figure 13) to appear. This screen simply maintains a continuous tally of the different types of data packets being collected during an exercise. This screen can be monitored from time to time to make sure that data packets are being collected.

Data Collection: Set Up

Exercise Control # (date): 91-6-3
Exercise ID: 001
Mission Type: Hasty Attack
Armor/Mech/Combined Arms: A
Organization:

Adding IDs

17.200.15 17.200.16 17.200.17 17.200.18

Type a date, then press Enter to accept.
<F1> to start Collecting Data. | <F2>, <F3>, and <F4> to select IDs.
<Esc> to return to Data Collection Menu.

Figure 12. Screen for limiting data collection to specified
vehicles.

Data Collection Summary

91-10-4   Hasty Attack   Collection Time Remaining:

Simulation Protocol   Data Management Protocol

Vehicle Appearance | 00000 | Change in Vehicle Status | 00000 |

Vehicle Impact | 00000 | Vehicle Status | 00000 |

Indirect fire | 00000 | Other | 00000 |

Fire | 00000 |

Other | 00000 | Other Protocols | 00000 |

Counter Display

F1:TURN OFF. F3:Interrupt Data Collection. F4:Keyboard Lock.   ESC: Stop

Figure 13. UPAS Data Collection Record Screen.

14

Platoon Organization

By selecting the Platoon Organization option from the Data Collection Menu you can designate the vehicle assignments for each company and subordinate platoon in the exercise. This information must be loaded into the UPAS to use the AAR aids.

When you select the Platoon Organization option, a pop up menu will appear with the options Company A, Company B, Company C, and Company D. Use the arrow keys to move to the appropriate option, and press the <Enter> key. If you select one of the companies, the next pop-up menu will provide a list of platoon options (Platoon 1 through 2 and attached platoon). Use the arrow keys to make your selection and press the <Enter> key.

The screen illustrated in Figure 14 will appear after you have selected a specific platoon. You must type in the IDs for the platoon leader's vehicle and platoon sergeant's vehicle separately from the rest of the vehicles. To type in the vehicle IDs for the platoon leader of platoon sergeant, press the <F2> key. Press the <F3> to type in IDs for the other vehicles in the platoon. These IDs are made up of the SIMNET host, site, and vehicle number rather than the bumper numbers. The three components of the ID must be separated from each other with a period, and a space should be used to separate vehicle IDs. When all of the vehicle IDs have been recorded, press the <F1> key to save the IDs for the entire platoon.

```
┌────────────────────────────────────────────────────────────────┐
│                     Platoon Organization                         │
├────────────────────────────────────────────────────────────────┤
│                                                                  │
│  Leader ID: 3.4.1594                     Sergeant ID: 3.4.1545   │
│                                                                  │
│   ┌──────────────────────────────────────────────────────────┐  │
│   │ Vehicle 1 ID: 3.28.1           Vehicle 3 ID:             │  │
│   │ Vehicle 2 ID: 3.4.1591         Vehicle 4 ID:             │  │
│   │                                                            │  │
│   └──────────────────────────────────────────────────────────┘  │
│                                                                  │
│  Enter Vehicle ID for Company A / Platoon 1                      │
│                                                                  │
│                                                                  │
│                                                                  │
│  <F2> Commander Field.   <F3> Vehicle Field.   Use Arrow Key to Change Position. │
│  <F1> to Save.  <Enter> to Accept.  <ESC> Return to Previous Menu. │
│                                                                  │
└────────────────────────────────────────────────────────────────┘
```

Figure 14. Screen for entering IDs of vehicles assigned to a particular platoon.

You can enter IDs for up to six platoons within a company. This feature allows you to include the vehicle IDs for attached platoons or sections. When all platoons of interest have been identified, press the <Escape> key to return to the Data Collection Menu.

If you select the Company HQ option, you will be asked to type in the vehicle IDs for the Company Commander and the Executive Officer (XO).

Master Event List

The Master Event List option allows you record up to seven time-tagged events from the unit operations order, such as the time the unit is expected to cross its Line of Departure. Recording this information is useful, because it will allow you to move through the replay of the exercise on the Plan View from one planned event in the mission directly to another. Information you place in the Master Event List is automatically tied to the Plan View.

Figure 15 illustrates a Master Event List screen on which the user has listed four events and the time that each event is to occur. To start typing the first master event only, you must first press the <F2> key. After you type the event, press the <Enter> key to move to the time column. After you type in the hour, you must press the <Enter> key to move to the minute portion of the time column. After you type in the minutes, press <Enter> and the entire line you have just typed will be highlighted. If you want to add or append another event to the list, press the <F4> and start typing. Each event may be up to twenty characters in length.

If you decide that you missed a key event and want to go back and insert it in the correct time sequence, move the cursor to the line immediately below where you want to make the insertion and press the <F3> key. UPAS will then allow you to type in the event at the desired location.

When you have completed the list, press the <F1> key to save the list and you will automatically exit the Master Event List option. If you re-enter the Master Event List option to make edits, move the cursor to the line you want to change and press the <F2> key. If you want to delete a line, move the cursor to that line and press the <F9> key. To exit after making your changes, press ' ↵ <F1> key. Press the <Esc> key to exit without saving your changes.

```
┌─────────────────────────────────────────────────────────────────┐
│                      Master Event List                            │
│  ┌──── Event ─────────────────────────────── Time ────────        │
│                                                                   │
│   Move out of AA                                  06:30           │
│   Cross LD                                        06:45           │
│   Cross PL Dog                                    07:10           │
│   Assault Position                                07:30           │
│                                                                   │
│                                                                   │
│                                                                   │
│  ───────────────────────────────────────────────────────────     │
│   <F1> Save Change and Exit   <F4> Append          ↑  Move Up     │
│   <F2> Edit                     <F9> Delete        ↓  Move Down   │
│   <F3> Insert                 <ESC> Exit Without Change  <Enter> Move Down │
│                                                                   │
└─────────────────────────────────────────────────────────────────┘
```

Figure 15.   Example of a Master Event List.

Control Measures

     The Control Measure Option will allow you to record the name
and location of unit control measures from the unit's operations
order and graphics. Once this information is recorded, the name
and location of these control measures will automatically be
displayed on appropriate AAR aids such as the Battle Flow Chart.

     If you select the Control Measure option, you will see the
display with the options "add", "delete", and "edit". The "add"
option is used to enter control measures into the UPAS, the
"delete" option is used to remove one or more of the control
measures from the database, and the "edit" option is used to
change the name or coordinates for a control measure. The "edit"
option can also be used to view the list of control measures and
their coordinates.

     If you select the "add" option, a menu similar to that shown
in Figure 16 will appear. Move the cursor to the type of control
measure for which you want to provide information and press the
<Enter> key.   The next pop-up menus will ask you to type in the
name of the control measure and the X-Y coordinates

17

for the measure. Figure 17 shows the combination of screens used
to input information for a check point.

```
┌─────────────────────────────────────────────────────────────────┐
│                         Data Collection                           │
├─────────────────────────────────────────────────────────────────┤
│                                                                   │
│                    Set Data Path                                  │
│                    Collect Data            ┌──────────────────┐   │
│                    Convert Data to NTC For │ Check Point      │   │
│                                            │ Starting Point   │   │
│                    Platoon Organization    │ Release Point    │   │
│                    Master Event List       │ Assembly Area    │   │
│                                            │ Objective        │   │
│                    Control Measures        │ Phase Line       │   │
│                                            │ Boundary Line    │   │
│                                            └──────────────────┘   │
├─────────────────────────────────────────────────────────────────┤
│  Use up or down arrow keys to highlight selection.                │
│  <Enter> to accept.                                               │
│   <Esc> to return to Main Menu                                    │
└─────────────────────────────────────────────────────────────────┘
```

Figure 16.   UPAS Menu for selecting control measures.
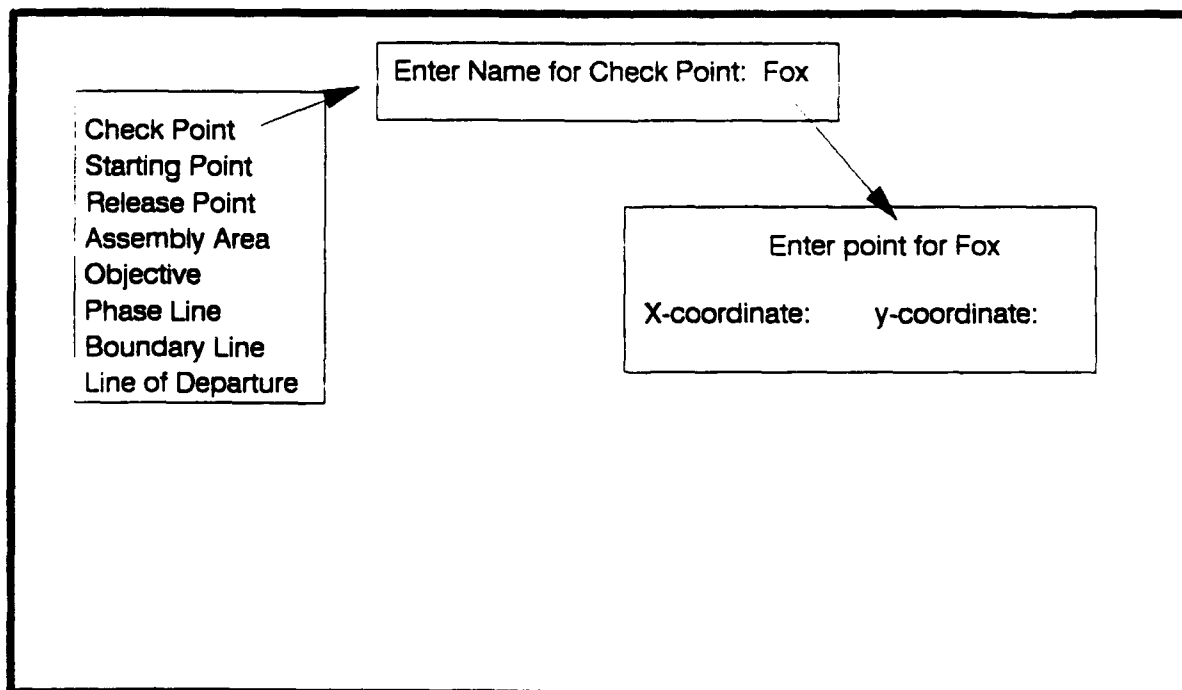

Figure 17.   Sequence of screens used to input data on check
points.

For line control measures you must provide the X-Y coordinates for at least two points. You can use up to twelve points to describe the location of areas, but three points are usually adequate. After you have entered the coordinates for one point, press the <Enter> to enter the coordinates for the next point. When you have entered enough points to describe a particular control measure, press the <F1> key to save the description and return to the menu of control measure types.

Repeat the above procedure for each control measure. Notice that UPAS will allow you to record more than one instance for each type of control measure, such as recording multiple phase lines. After all of the control measures are recorded, press the <Escape> key to return to the initial Control Measure menu.

Select the "delete" option from the Control Measure menu to remove the description of a particular control measure. The screen for deleting control measures (Figure 18) lists the names of all the control measures you have described. Use the up and down arrow keys to move along the list of names, and press the <Enter> key to select the control measures you want to delete. After you have selected all of the control measures to be deleted, press the <F1> key. To prevent accidental erasure, a prompt will ask you to confirm that you want to delete these records. Type "y" if you want to delete the records.

```
+------------------------------------------------------------------+
|                    Control Measure..DELETE                       |
+------------------------------------------------------------------+
|                                                                  |
|  Select records to delete                                        |
|                                                                  |
|  +---------------------+                                         |
|  | Assembly Area       |     Record(s) about to be deleted.      |
|  |  Fox                |     Confirmation : Y/N ?                 |
|  | Rabbit              |                                         |
|  | Snake               |                                         |
|  | TRP1                |                                         |
|  | TRP2                |                                         |
|  | TRP3                |                                         |
|  | Objective           |                                         |
|  +---------------------+                                         |
+------------------------------------------------------------------+
|  Use up and down arrow keys to highlight selection.              |
|  <F1> to delete from database.                                   |
|  <Enter> to select/un-select.          <Esc> to previous menu.   |
+------------------------------------------------------------------+
```

Figure 18. Sample screen for selecting control measures to be deleted.

19

Select the "edit" option from the Control Measure menu if
you want to change the name or coordinates of control measures,
or if you want to check the information previously entered. The
next screen will provide a list of the names of the control
measures, as shown in Figure 19. To view or edit one of these
measures, use the arrow keys to select the measure of interest
and press the <Enter> key. Figure 20 provides an example of the
screen used to edit control measures. Press the <F2> key to edit
the name of the control measure, and press <F3> to edit the
coordinates for the measure. If you select to change
coordinates, for example, you will be able to type in a new X
coordinate for Point 1. After you type this coordinate and press
<Enter> you will be able to change the Y coordinate. Use the up
and down arrow keys to move from one point to another. After you
have finished making all the necessary changes for a control
measure, press the <F1> key to save the changes.

```
                        Control Measure- -EDIT                    Screen 1


  Select record to modify

  ┌─────────────────────┐
  │ Assemby Area        │
  │  Fox                │
  │ Rabbit              │
  │ Snake               │
  │ TRP1                │
  │ TRP2                │
  │ TRP3                │
  │ Objective           │
  └─────────────────────┘

  Use up and down arrow keys to highlight selection.

  <Enter> to select

  <Esc> to previous menu.
```

Figure 19. Sample screen for selecting a control measure to be
edited.

```
+-------------------------------------------------------------------+
|                  Control Measure- -EDIT              Screen 2      |
+-------------------------------------------------------------------+
|                                                                   |
|    Phase Line          | Fox            |                         |
|                        +----------------+                         |
|    +-------------------------------------------------------+      |
|    |     Point 1.     X: | 92000 |   Y: | 87000 |          |      |
|    |     Point 2.     X: | 93000 |   Y: | 86000 |          |      |
|    |     Point 3.     X:            Y:                      |      |
|    |     Point 4      X:            Y:                      |      |
|    |     Point 5.     X:            Y:                      |      |
|    |     Point 6.     X:            Y:                      |      |
|    |     Point 7.     X:            Y:                      |      |
|    |     Point 8.     X:            Y:                      |      |
|    +-------------------------------------------------------+      |
+-------------------------------------------------------------------+
|  Use arrow and <ENTER> keys to highlight fields.                  |
|  <F1> Save modified data to database.                             |
|  <F2> Modify name field.          <F3> Modify point field.        |
|                                   <Esc> to previous menu.         |
+-------------------------------------------------------------------+
```

Figure 20. Sample screen for editing control measures.

Converting Data to the National Training Center Format

None of the AAR aids can be used until the network data have
been loaded into the NTC database. This loading process is
referred to as NTC data conversion because data are loaded into a
relational database management system patterned after the NTC
database. At the same time that data are being loaded into the
database, selected data filtering and indexing tasks are also
automatically performed by the UPAS. One of the many benefits of
this conversion process is the production of an index that UPAS
uses to help you move forward and backward quickly from one point
in the battle to another when using the Plan View, Battle Flow
Chart, or Battle Snapshot.

The UPAS is capable of filtering the data loaded into the
NTC database to help reduce the volume of data to be stored.
A large portion of the data collected from the network is in the
form of Vehicle Appearance Packets that are broadcast by each
vehicle in an exercise at one second intervals. At times in the
exercise when there is little action, most of these packets are
identical to the previous packet for a particular vehicle except
for the time stamp. A default option in the UPAS causes data on
the status of vehicles to be loaded into the SIMNET/NTC database
at five minute intervals unless a significant event (such as a
firing event) occurs. The interval at which data are loaded into
the SIMNET/NTC database is selectable so that you can change it
if, for example, you want to update the vehicle status data at
ten second intervals.

Select the Convert Data to NTC Format Option from the Data Collection Menu. If the exercise data in the subdirectory in which you are working have already been converted, you will see the screen shown in Figure 21. If you do not want to reconvert the data, press the <ESC> key to return to the previous menu. In certain cases you may want to reconvert the data using a new time interval and you do not care if the data converted under the previous interval are erased. In this case, type "Y" in response to the prompt, and the next screen in the conversion process will appear.

```
Data Conversion has been performed

Data conversion interval used:          5 minutes

Exercise ID:                            001

Exercise Date:                          91-5-10



            Do you want to re-convert data (Y/N)?
```

Figure 21. Screen displayed when a user attempts to perform a National Training Center data conversion on data that have already been converted.

When you are ready to proceed with the data conversion process, the screen shown in Figure 22 will be displayed. The "Data Conversion Interval" section at the top of the NTC conversion screen allows you to select the interval at which data will be loaded into the database. The default is five minutes. If you want to use another interval, type the new interval using numbers at the top of the keyboard in the format shown in Figure 22. However, you should consider that the shorter the interval you select, the longer the data conversion process will be.

```
┌─────────────────────────────────────────────────────────────┐
│                                                               │
│                   NTC DATABASE: Convert                       │
│                                                               │
├─────────────────────────────────────────────────────────────┤
│                                                               │
│   ┌───────────────────────────────────────────────────────┐ │
│   │                                                         │ │
│   │          Data Conversion Interval:  05:00               │ │
│   │                                                         │ │
│   │          Data Conversion Needed:  10     Minutes        │ │
│   │                                                         │ │
│   │          CAUTION: SHORTER INTERVALS WILL REQUIRE        │ │
│   │          LONGER CONVERSION TIME                         │ │
│   │                                                         │ │
│   └───────────────────────────────────────────────────────┘ │
│                                                               │
├─────────────────────────────────────────────────────────────┤
│  <F1> to start Conversion.                                    │
│                                                               │
│  <Esc> to Previous Menu                                       │
│                                                               │
└─────────────────────────────────────────────────────────────┘
```

Figure 22. UPAS National Training Center Data Conversion screen.

The "Data Conversion Needed" section of the screen indicates the amount of time required to convert the data. UPAS estimates this conversion time based upon the amount of data to be converted. Actual conversion time depends on the conversion interval you have selected and the operating speed of your computer. For a 286 computer, the estimate is accurate for a five minute conversion interval. For a 386 computer, the actual conversion time is about one-third that shown on the screen for a five minute conversion interval.

To start the data conversion process, press the <F1> key. The progress of the conversion process will then be indicated on your screen by showing the number of data packets that remain to be converted, as illustrated in Figure 23. At the end of the data conversion process, the message "Data conversion process has been successfully completed" will appear on your screen.

23

```
┌─────────────────────────────────────────────────────┐
│                                                       │
│              NTC DATABASE: Convert                    │
│                                                       │
├─────────────────────────────────────────────────────┤
│                                                       │
│   ┌───────────────────────────────────────────────┐ │
│   ┆                                                 │ │
│   ┆          Data Conversion (Left):    12212       │ │
│   ┆                                                 │ │
│   └───────────────────────────────────────────────┘ │
│                                                       │
├─────────────────────────────────────────────────────┤
│                                                       │
│ <F2> to stop Conversion and return to Previous Menu.  │
│                                                       │
└─────────────────────────────────────────────────────┘
```

Figure 23. Screen used to monitor the progress of data conversion to the National Training Center format.

Using Data Summary Menus

When you select the "Data Summary" option from the UPAS Main Menu, the screen shown in Figure 24 will appear. The "Display Graph" and "Display Table" options are used to access menus of data summary graphs and tables, respectively. The "Packet Access" option is not a data summary function. Instead, this option allows you to look at the data in the individual packets collected from the simulation network. Since this option would rarely, if ever, be used to prepare for an AAR, the use of this option is discussed in the Advanced UPAS User's Guide.

The "After Action Review" option provides access to the Plan View Display, Battle Snapshot, Battle Flow Chart, and Exercise Timeline functions of the UPAS. The "Battle Scorecards" option provides access to two data summary tables describing the effects of direct and indirect firing events. Use of the various options, other than the one for packet access, is described below. Instructions for preparing your printer to make copies of UPAS graphs, tables, and figures are provided at the end of this chapter.

```
+-------------------------------------------------------+
|                                                       |
|                  Data Summary                         |
|                                                       |
+-------------------------------------------------------+
|                                                       |
|                                                       |
|                  Display Graph                        |
|                                                       |
|                  Display Table                        |
|                                                       |
|                  Packet Access                        |
|                                                       |
|                  After Action Review                  |
|                                                       |
|                  Battle Scorecards                    |
|                                                       |
|                                                       |
+-------------------------------------------------------+
| Use up or down arrow keys to highlight selection.     |
| <Enter> to accept.                                    |
| <Escape> to return to Main Menu.                      |
+-------------------------------------------------------+
```

Figure 24. UPAS Data Summary Menu Screen.

Display Graphs

UPAS includes a menu of graph options for your use. These graphs were designed to meet some of the information needs of users after SIMNET exercises. To gain access to these graphs from the Data Summary menu, select the "Display Graph" option and a screen similar to that shown in Figure 25 will appear. This screen allows you to select the unit performance graph that you want to examine. To select a graph move the cursor to your selection using arrow keys and press the <Enter> key. Only a portion of the graph options are shown on the screen at any one time. To examine additional options continue to use the down arrow key when you reach the last selection on the screen.

```
+--------------------------------------------------------------+
|                       Display Graphs                         |
+--------------------------------------------------------------+
|                                                              |
|      +----------------------------------------------+        |
|      | Rounds Fired Over Time                       |        |
|      | Rounds Fired Over Time by Weapon             |        |
|      | Rounds Fired Over Range                      |        |
|      | Rounds Fired Over Range by Weapon            |        |
|      | Vehicles Hit over Range by Type              |        |
|      | Vehicles Hit Over Time by Type               |        |
|      | Vehicles Hit by Firing Side Over Time        |        |
|      +----------------------------------------------+        |
|                                                              |
+--------------------------------------------------------------+
| Use up or down arrow keys to highlight selection.            |
| <Enter> to select.                                           |
| <Esc> to return to Data Summary Menu.                        |
+--------------------------------------------------------------+
```

Figure 25. UPAS menu of graph options.

After you select a graph option, a pop-up menu will appear
with the options "Red" and "Blue." If you want to use data for
the BLUFOR only, move the cursor to blue and press the <Enter>
key. Blue will then be displayed in reverse video. Reverse
video will appear as blue on gray at the cursor position, and
white on blue elsewhere. If you also want to include "REDFOR"
data, repeat the procedure with the red option. After you have
finished indicating your selections, press the <F1> key.

Depending on the graph you select, you may have to respond
to additional menu screens after the Red/Blue menu. For example,
if you selected the graph option "Rounds Fired over Time by
Weapon", a menu of weapon types would appear on your screen, as
shown in Figure 26. According to the guidance at the bottom of
the screen, you may select up to three different types of weapons
by using arrow keys to scroll through the list and pressing
<Enter> each time you come to a weapon you want to select. After
you have selected all of the weapon systems, press the <F1> key.
The resulting graph would be similar to that shown in Figure 27.

Display Graphs	
Rounds Fired Over Time	US M904 Bomb
Rounds Fired Over Time by Weapon	US M557 - 107mm
Rounds Fired Over Range	US M513 - 107mm
Rounds Fired Over Range by Weapon	US M739 -105mm
Vehicles Hit over Range by Type	US M728 - 155mm
Vehicles Hit Over Time by Type	US M791 - 25mm
Vehicles Hit by Firing Side Over Time	US M792 - 25mm/HEI

Use up or down arrow keys to highlight selection.
<Enter> to select. <F1> to accept. Select up to 3 items.
<Esc> to return to Data Summary Menu.

Figure 26. UPAS menu of weapon system options.
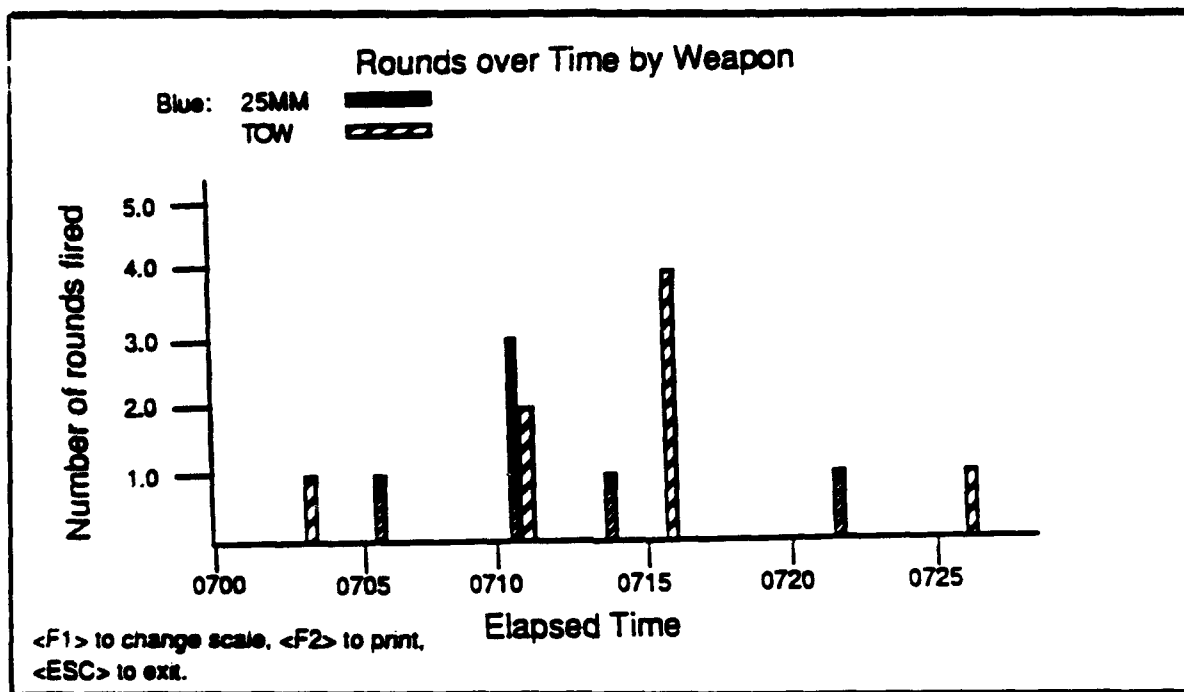
Figure 27. UPAS graph showing BLUFOR firing events as a function of time and weapon type.

In certain cases you may want to increase or decrease the scales used for the X and/or Y axis of the graph. The primary reason for changing scales is to focus attention on a critical part of the scale. For example, you may be interested in focusing attention on the volume of friendly and enemy fires during the assault portion of a mission, rather than displaying fires for the entire mission.

To modify the X or Y scales, press the <F1> key, and a screen like that in Figure 28 will appear. To change the default end points of a scale, enter the new scale values using the numeric keypad, then press enter. Press the <F1> key to view the graph with the new scales.

```
┌─────────────────────────────────────────────────────────┐
│                                                           │
│                      Setup Scale                          │
│                                                           │
├─────────────────────────────────────────────────────────┤
│                                                           │
│                                                           │
│                  Time    1020    1040                     │
│                                                           │
│                  Count    0      60                       │
│                                                           │
│                                                           │
│                                                           │
│                                                           │
├─────────────────────────────────────────────────────────┤
│  Type 0-9999 to change scale, then press ENTER.           │
│  Press F1 to see GRAPH                                     │
│  Press Esc to ignore changes.                             │
└─────────────────────────────────────────────────────────┘
```

Figure 28. UPAS Scale End Anchor screen for changing X and Y
scales for graphs.

     If you want a hard copy of the resulting graph, press the
<F2> key.   When you are finished looking at the graph, press the
<Escape> key to return to the menu of graph options.

Display Tables

     UPAS includes a menu of table options. To access these
tables from the Data Summary menu, select the "Display Table"
option and a screen like Figure 29 will appear. The titles of
the available tables will be changed over time, as the tables are
modified in response to feedback from users. To select a table
move the cursor to your selection using arrow keys and press the
<Enter> key. Only a portion of the table options are shown on
the screen at any one time. To examine additional options use
the down arrow key to move to the last selection on the screen
and then continue pressing the arrow key.

     Table 1 illustrates one of the data summary tables from the
UPAS menu. To print a hard copy of the table, press the <F2>
key.

```
┌─────────────────────────────────────────────────────────────────┐
│                                                                   │
│                        Display Tables                             │
│                                                                   │
├───────────────────────────────────────────────────────────────────┤
│                                                                   │
│   ┌─────────────────────────────────────────────────────────┐   │
│   │  FIRING EVENTS BY SIDE, TIME, RANGE, AND RESULT          │   │
│   │  FIRING EVENTS BY SIDE AND TIME                          │   │
│   │  FIRING EVENTS BY SIDE AND WEAPON TYPE                   │   │
│   │  BLUFOR FIRING EVENTS BY TIME                            │   │
│   │  INDIRECT FIRE MISSIONS BY TIME AND LOCATION             │   │
│   │  FUEL EXPENDED, BY VEHICLE                               │   │
│   │  AMMO EXPENDED, BY VEHICLE                               │   │
│   └─────────────────────────────────────────────────────────┘   │
│                                                                   │
│                                                                   │
├───────────────────────────────────────────────────────────────────┤
│  <Down> or <PgUP> to Move Cursor.                                 │
│  <Return> to Select.                                              │
│  <Esc> to Previous Menu.                                          │
└─────────────────────────────────────────────────────────────────┘
```

Figure 29. Pop-up Menu for UPAS Data Summary Tables.

TABLE 1.   FIRING EVENTS AS A FUNCTION OF TIME, RESULT, AND RANGE.

TIME	FIRING SIDE	RESULT	RANGE
06:45:00	R	M	1430
07:03:00	B	H	1860
07:04:00	B	H	1781
		M	1612
	R	M	2263
		H	1856
07:05: 0	B	M	1563
		M	1836
		K	1132
		H	1894
	R	K	1900
		H	1918

Menu of After Action Review (AAR) Aids

After selecting the After Action Review option from the Data Summary Menu, you will see the screen shown in Figure 30. This menu allows you call up the four AAR aids. One of these aids, the Battle Snapshot, is unique in that using this aid requires that you know the exercise time for which you want to create a snapshot. Such times may be based on; your observations of critical event during the exercise, time-tagged events from the Master Event List, graphs or tables showing certain activities as a function of time, a review of selected phases of the battle using the Plan View, a review of a unit's overall movement using the Battle Flow, or a review of the Exercise Timeline for an exercise.

Three of the AAR aids (the Plan View, the Battle Flow, and the Snapshot) require the UPAS to generate a terrain map on your screen, and this process requires roughly a minute and a half. Each time you are using one of these aids and change time or space variables (i.e., scale or origin of the map) another minute and a half will be required to regenerate the map. As you read through the instructions for using these aids, notice that we have included utilities and procedures that help to reduce the number of times that a map must be regenerated on your screen.

After Action Review

Plan View

Battle Flow

Battle Snapshot

Exercise Timeline

Use up or down arrow keys to highlight selection.

<Enter> to accept.

<Escape> to return to Previous Menu

Figure 30. After Action Review Main Menu.

Plan View Display

Select the Plan View option from the AAR Menu and a terrain map of the exercise area will form slowly on your screen. Roughly a minute and a half is required for UPAS to generate a terrain map, and when it is finished you will see something like Figure 31.
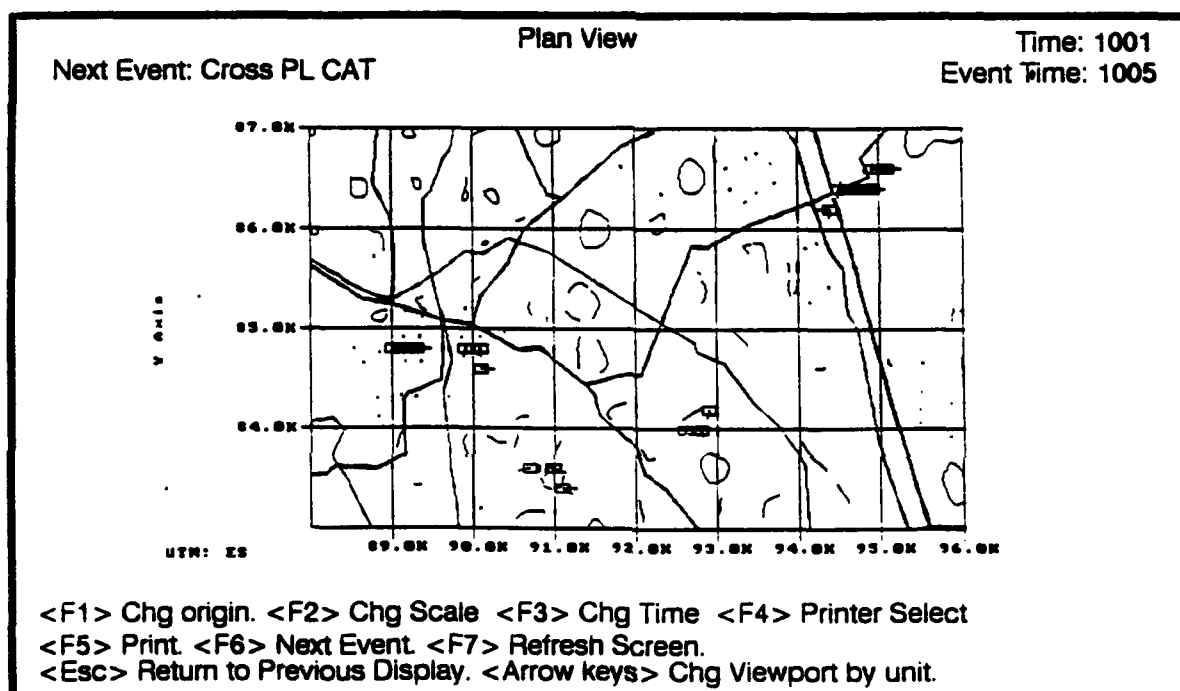
Figure 31. Plan View Display screen.

The Plan View Display screen presents a portion of a terrain map with vehicles represented by icons (blue for BLUFOR and red for REDFOR). A vehicle that has just fired will temporarily brighten in color, and a vehicle that has been killed will change color permanently (BLUFOR to cyan and REDFOR to white). The various terrain features are indicated according to the scheme described in the table below.

TABLE 2.   COLORS USED TO REPRESENT TERRAIN FEATURES IN PLAN VIEW
DISPLAY

FEATURE	COLOR AND SHAPE REPRESENTATION
Buildings	Purple Dots or Squares (depenᵤing on level of magnification)
Highway	Grey Lines
Dirt Road	Brown Lines
Rivers/Lakes	Cyan Lines or Ovals
Tree Line	Green Line
Tree Canopy	Green Oval

The Plan View allows you to change the origin of a display,
the level of magnification of the display, and the time for
starting a replay of an exercise. When you make any of these
changes, the terrain map will need to be regenerated. To reduce
the amount of time you spend waiting for the terrain map to be
regenerated, a special function has been built into the UPAS that
allows you to make more than one change at a time. For example,
if you select the option of changing the origin of a display, you
will also be given the opportunity to change the scale and the
time of the start of the replay before the terrain map is
regenerated. After you change any of the settings within the
Plan View you will see the screen shown in Figure 32.
Instructions for changing each type of setting are provided
below.

```
┌─────────────────────────────────────────────────────┐
│                                                       │
│                                                       │
├─────────────────────────────────────────────────────┤
│                                                       │
│                                                       │
│                                                       │
│                                                       │
│       Please Enter Another Selection                  │
│                                                       │
│                                                       │
│                                                       │
│                                                       │
├─────────────────────────────────────────────────────┤
│  <F1> Chang Origin.  <F2> Chang Scale.  <F3> Enter Time.  │
│  <F4> Printer Setup.  <F5> Next Event.  <F6> Return to Display.  │
└─────────────────────────────────────────────────────┘
```

Figure 32.   Screen allowing user to change multiple Plan View
settings.

Navigating in time through an exercise.   When using the
Plan View you will usually be interested in observing the action
at specific points in time. For example, you may want to see how
the unit reacted the first time it received fire from the enemy,
or you may want to see if a unit crossed a phase line at the time
specified in the operations order.

    The UPAS Plan View provides two methods for changing the
point in the battle being displayed. First, you can move forward
or backward to a specific time by pressing the <F3> key. After
you press this key, a screen will appear asking you to type in
the new time you want to move to (Figure 33). Type in the
military time, such as "1600", and press the <Enter> key.

```
Enter New Time




Time  1020
```
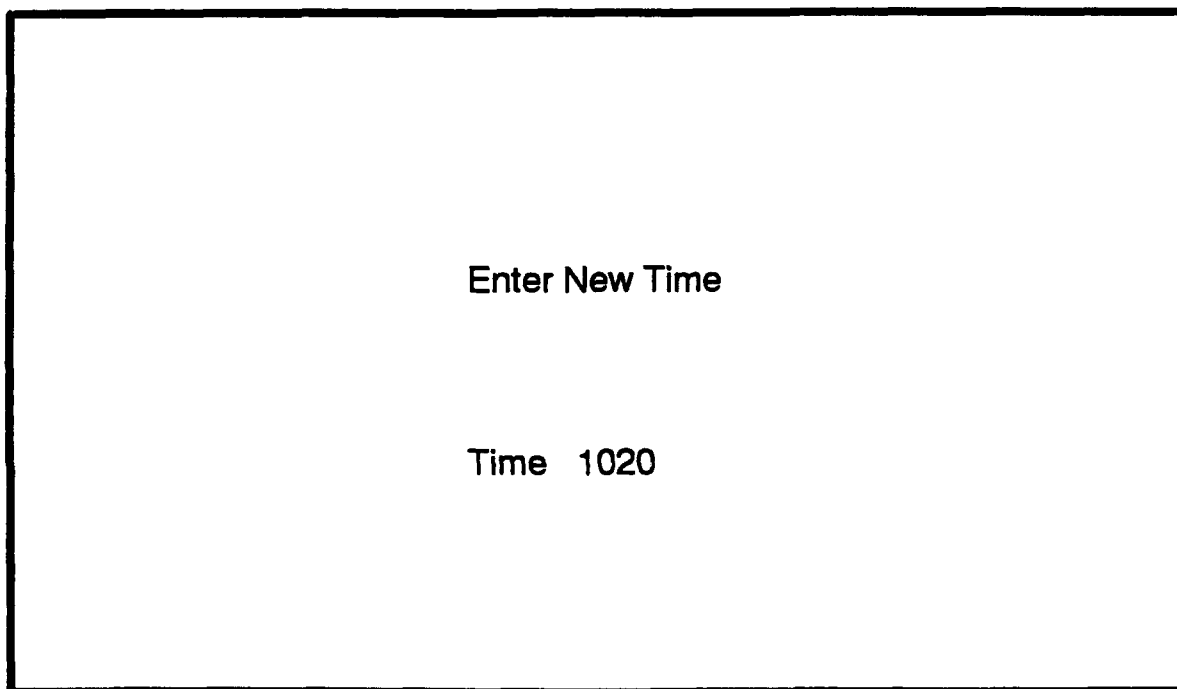
Figure 33. UPAS screen for changing the time within a replay of
an exercise on the Plan View Display

    Second, the UPAS Plan View can move to the points in time
addressed by the Master Event List. These are timed events input
by you in the UPAS, as described on pages 16 and 17. Note that
the top left portion of the Plan View provides the name of an
event. This event is taken from the Master Event List. The
right top part of the display indicates the time for the next
event from the Master Event List. To move to the time associated
with the next event, press the <F6> key.

You cannot adjust the speed of the replay. The icons move in simulated time (dependent on the system clock speed of your computer). When there is a large amount of action during an exercise (many firing events and vehicles moving), the speed of the replay will be slower than real time. When there is very little action, the speed of the replay may be ten times faster than real time.

Changing the origin of the Plan View Display. The initial screen covers an area of the battlefield 8 kilometers across the screen and 4 kilometers vertically. In Figure 34 (A), for example, the origin of the display is at 86000 meters east of the origin of the terrain map and 81600 meters north of the origin of the terrain map. The origin for the initial UPAS display is determined by UPAS, and it depends on the location of exercise vehicles.

If you want to see a different part of the battlefield, you can move the display origin to a new location. To shift the origin, first decide where you want the new origin to be. For example, after examining the display in Figure 34 (A), you may decide that you want to change the origin to 88000 meters east and 83000 meters north to obtain the display shown in Figure 34 (B). Press the <F1> key to call up the screen shown in Figure 35. Type in 88000 and press enter. A second prompt will appear asking you to record the Y coordinate. Type in 83000 and press enter.
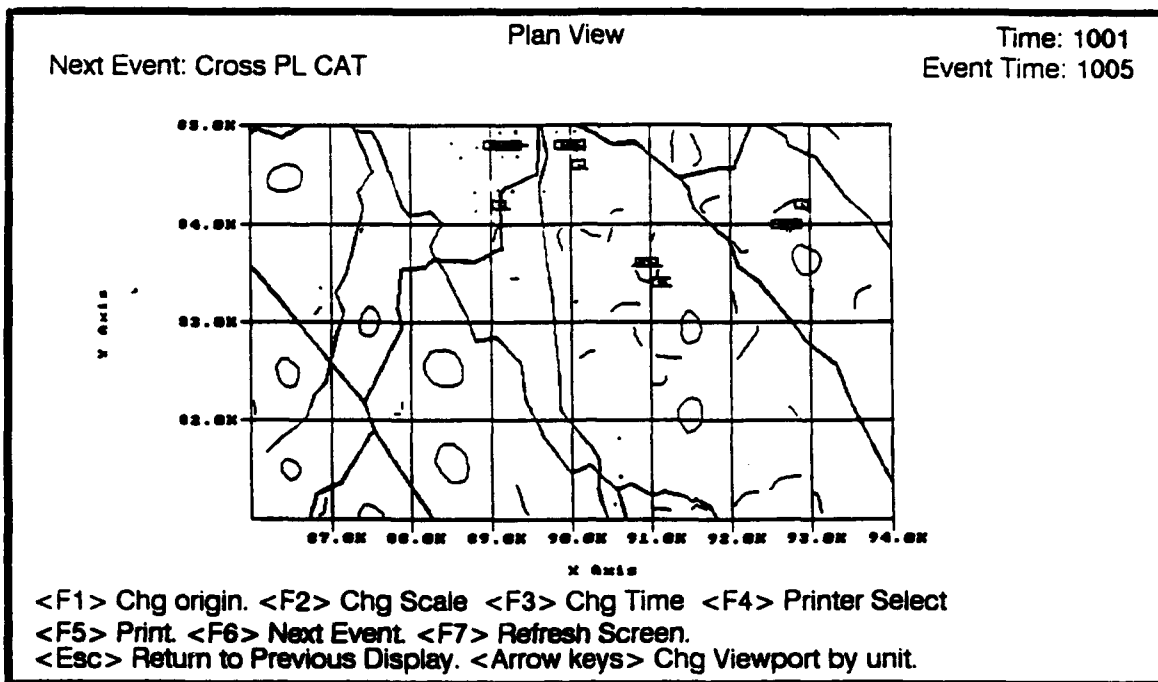
(A)
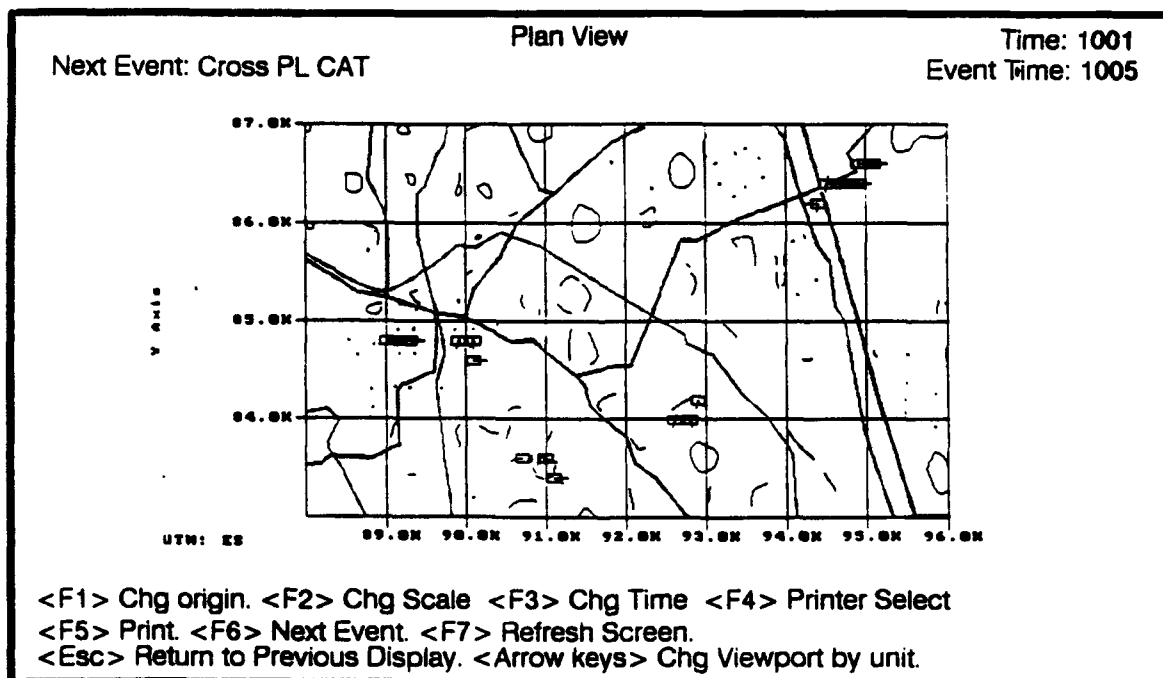
(B)

Figure 34.   Example of a Plan View Display screen before (A) and
after (B) origin has been altered.

```
Enter X (meters East of origin):

X: 86000      Y: 81600
```

Figure 35.   Screen for changing the origin of a Plan View
Display.

Changing the level of magnification of the battlefield.
You can also increase or decrease the portion of the battlefield
shown in the Plan View display to obtain a broader view of the
battlefield or to magnify a portion of the battlefield. This
option works by controlling the number of one kilometer by one
kilometer blocks included in the display. The blocks included in
the magnified display are measured from the origin. This means
that you should always make sure that the vehicles to be observed
will fall within the new blocks to be displayed. This is
accomplished by changing the origin of the display, as described
above, before attempting to magnify the battlefield.

     As mentioned above, the initial display covers 8 kilometers
horizontally and 4 kilometers vertically.   If you want to
increase or decrease the magnification of the battlefield press
the <F2> key, and the screen shown in Figure 36 will appear. By
typing in the numbers "4000" and "2000" in response to the
prompts, the number of one kilometer blocks included in the
display will be reduced from 32 (8 x 4) to 8 (4 x 2). Figure 37
illustrates the results of this magnification of the battlefield.

     The area on the screen that shows the terrain always remains
twice as wide as it is high, so if you choose scale values that
do not have a 2:1 ratio, such as 6 x 2 or 2 x 3, the square
kilometer blocks in the display will be stretched into
rectangles. It may be useful to do this to see more detail in an
area, but it distorts the picture of the terrain and the apparent
distances between vehicles.

The minimum portion of the battlefield that can be displayed on the Plan View is a 200 meter by 200 meter square. Therefore, if you type in numbers lower than 200 in value, the UPAS will automatically convert the value to 200.

Enter New Delta X (meters of screen scan from origin):

Current Delta X: 8000   Current Delta Y: 4000

Please enter the valid delta x between 200 and 200,000

Figure 36. Screen for changing level of magnification of the Plan View Display.
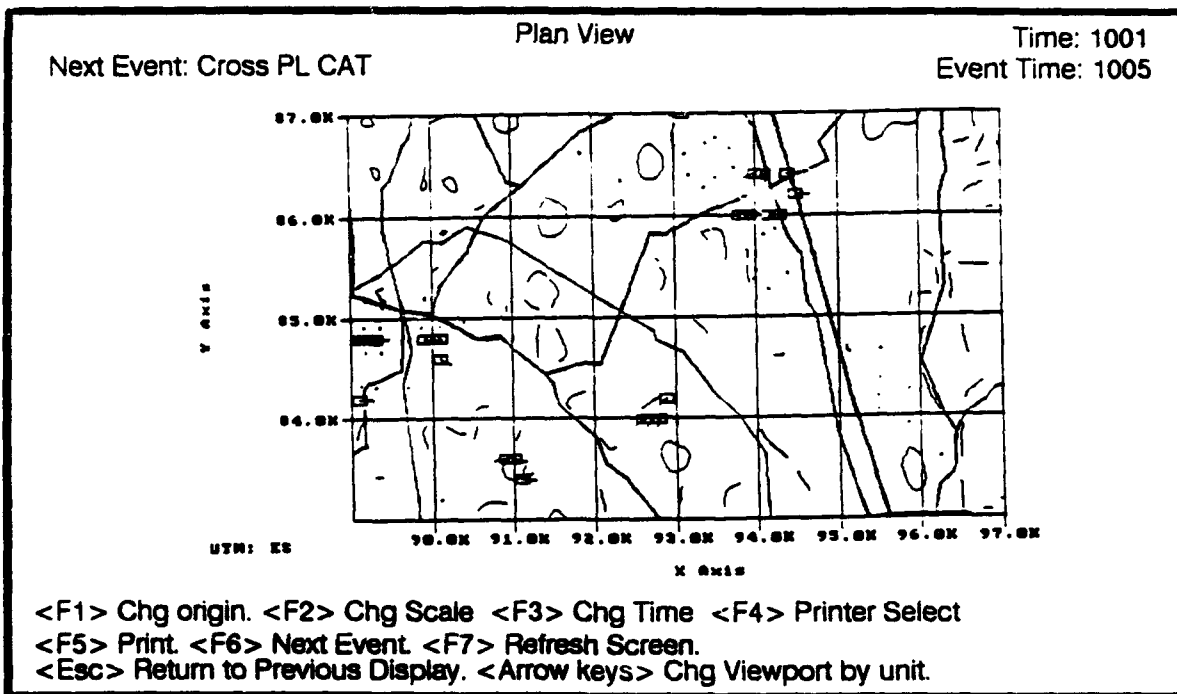
(A)
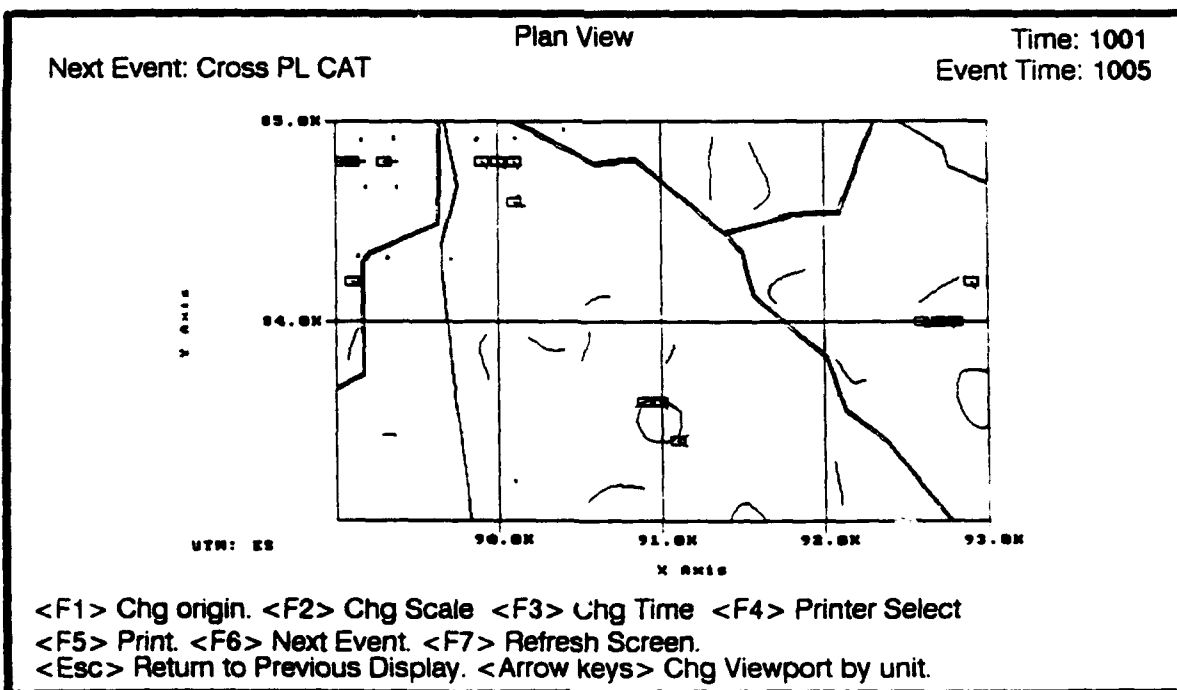
(B)

Figure 37. Example of a Plan View Display screen before (A) and after (B) magnification of the battlefield.

Setting up the Printer. Copies of all graphs, tables and
After Action Review screens can be made on your printer.
However, you must input certain information into UPAS before you
can use the printer function. The Plan View Display, Battle Flow
Chart, Battle Snapshot, and Exercise Timeline utilities all
provide the menus necessary for you to set up your printer, but
these menus are not contained in the graph and table utilities.
Once you have set up the printer within any one of these
utilities, it will be set up for all the After Action Review
Aids, all graphs, and all tables within UPAS. The printer will
remain set up even after it has been turned off.

To set up the printer, select any of the options from the
After Action Review Menu, and then press the <F4> key to call up
the printer set up menus. The first screen, shown in Figure 38,
prompts you to identify the type of printer you are using. If
your specific printer is not among those in the menu, select a
printer option that your printer can emulate. See the manual for
your printer to determine what emulation capabilities are
po_sible. If a manual is not available, or when in doubt, chose
the Epson FX option. Many printers can be set to emulate the
Epson FX option. Make sure that the printer settings are correct
for the chosen option before you try to print. Use the arrow
keys to make your selection, then press the <Enter> key.

```
Epson LQ
HP Laser Jet
Epson FX
```
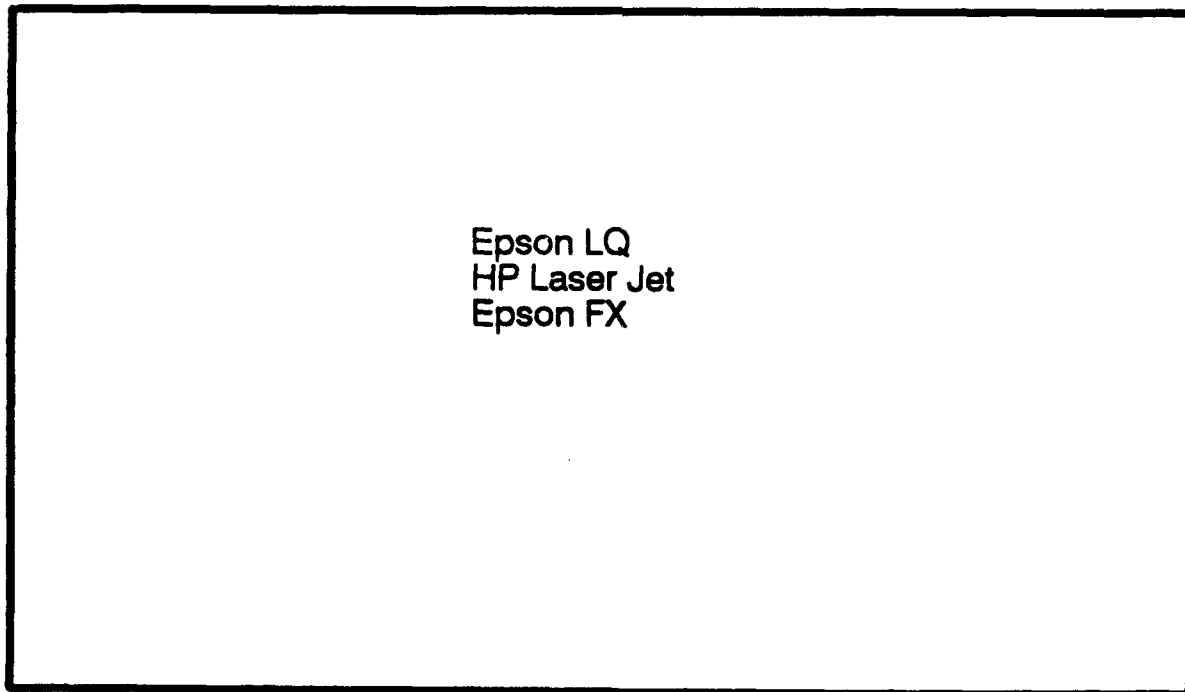
Figure 38.   Printer selection menu screen.

40

The sequence and content of subsequent screens encountered when setting up your printer depend on the printer you have selected. However, in all cases you will need to provide information about how your printer is connected to your computer by selecting one of the options shown in Figure 39.
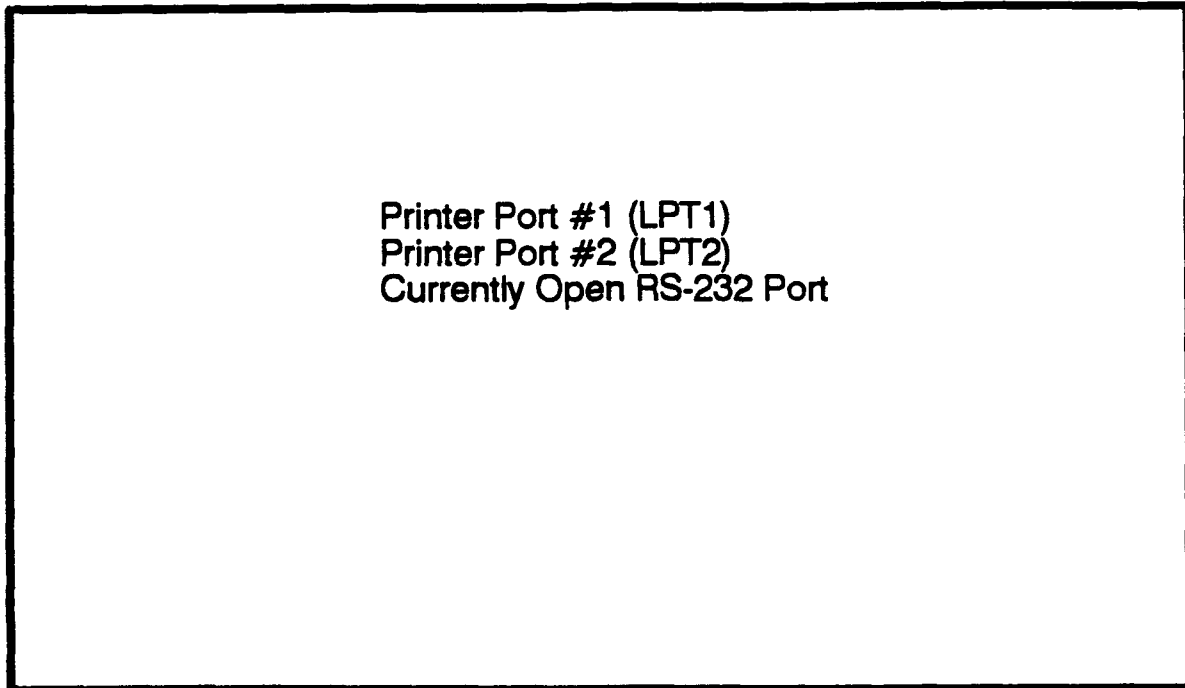
```
Printer Port #1 (LPT1)
Printer Port #2 (LPT2)
Currently Open RS-232 Port
```

Figure 39. Printer connection screen.

If you are using the Epson FX option, the next menu will contain the density and speed options shown in Figure 40. Use the arrow keys to select the first option, "single density, normal speed", and press <Enter>.

If you are using the HP Laserjet, you will be given the options shown in Figure 41. Use the arrow keys to choose the first option, "75 Dots/Inch", and press the <Enter> key.

Printing Screens. You can print a black and white copy of your screen at any point in time during the replay of an exercise. You should keep in mind that certain information is lost when going from a screen display to a hard copy. For example, a hard copy of a Plan View screen will not indicate whether the vehicles have been destroyed, and they will not indicate firing events.

41

Single Density, Normal Speed
Double Density, Half Speed
Double Density, Normal Speed
Quadruple Density
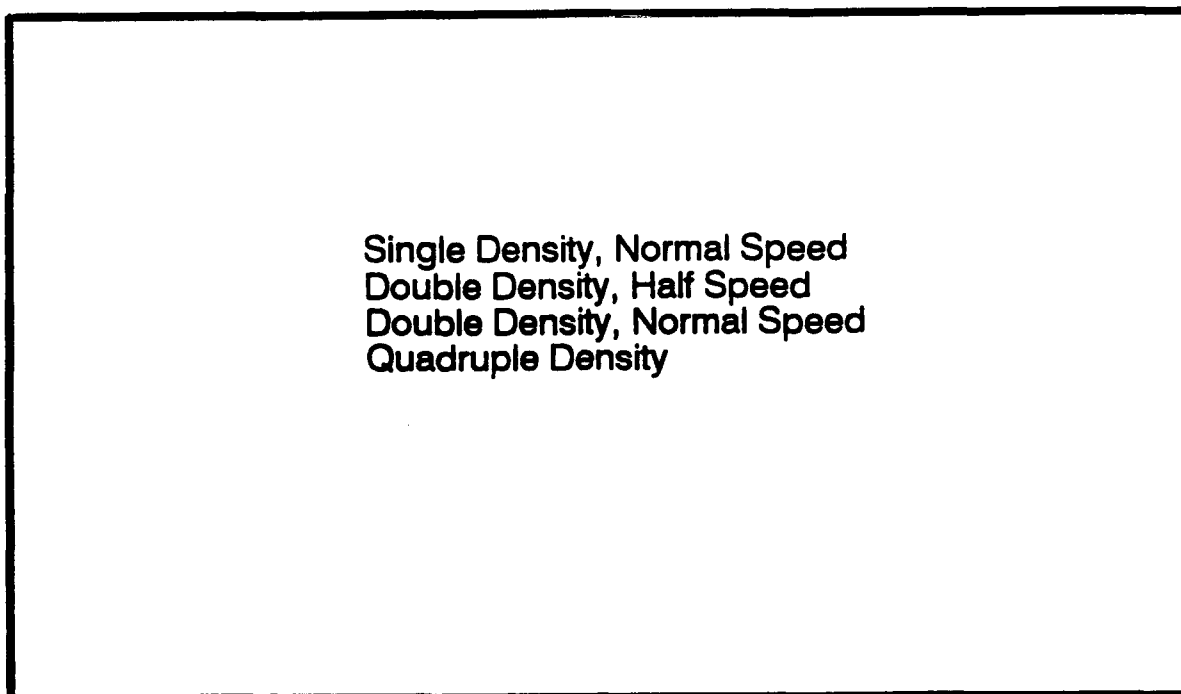
Figure 40. Printer density and speed menu screen for Epson FX
printers and printers that emulate Epson FX.

75 Dots/Inch

100 Dots/Inch

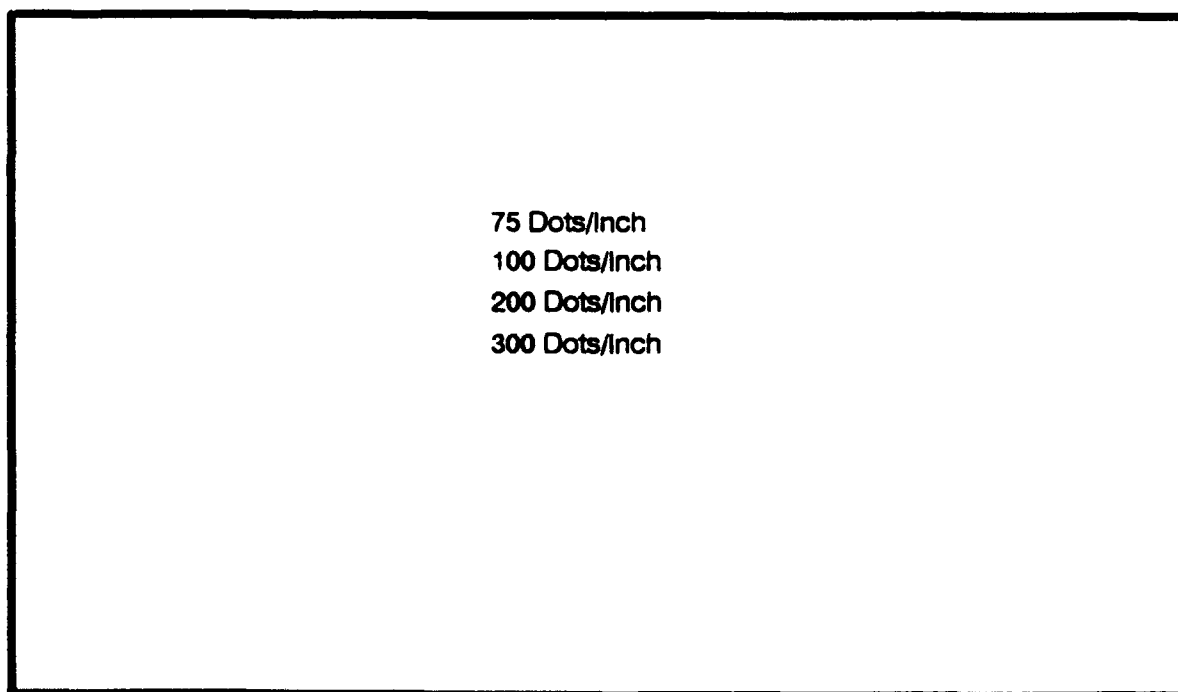200 Dots/Inch

300 Dots/Inch

Figure 41. Print density menu for the HP LaserJet printer.

Battle Flow Chart

The Battle Flow Chart traces the movement of a unit throughout a mission using plus (+) signs and numerals to indicate vehicle positions at intervals selected by you. For example, you might decide to mark vehicle positions at one minute intervals with time markers at five minute intervals.

The trace of unit movement is displayed over the same background used for the Plan View (grid map with color-coded major terrain features and control measures). BLUFOR vehicles are initially shown as blue dots that change to cyan when the vehicles are killed. OPFOR movement is not shown, but the initial locations of OPFOR vehicles at the start of the exercise are indicated by gray dots.

Use the arrow keys to select the Battle Flow option from the After Action Review menu and press the <Enter> key. After you select the Battle Flow Chart option, the next two screens will provide a list of company and platoon menu options respectively. After selecting a company (e.g., company A), press the <Enter> key and a menu of platoon options will appear. Use the arrow keys to select a platoon and then press the <Enter> key. Note that you can view only one platoon at a time using the Battle Flow.

Figure 42 illustrates a screen for a Battle Flow Chart. Roughly a minute and a half is required to develop the terrain map on your screen. The Battle Flow allows you to change the origin of a display, the level of magnification of the display, the time for starting a trace of an exercise, and the interval at which vehicle positions are marked. When you make any of these changes, the terrain map will need to be regenerated. To reduce the amount of time you spend waiting for the terrain map to be regenerated, a function has been built into the UPAS that allows you to make more than one change at a time. For example, if you select the option of changing the origin of a display, you will be given the opportunity to make other changes as well before the terrain map is regenerated. After you change any of the settings within the Battle Flow you will see the screen shown in Figure 43. Instructions for changing each type of setting are provided below.
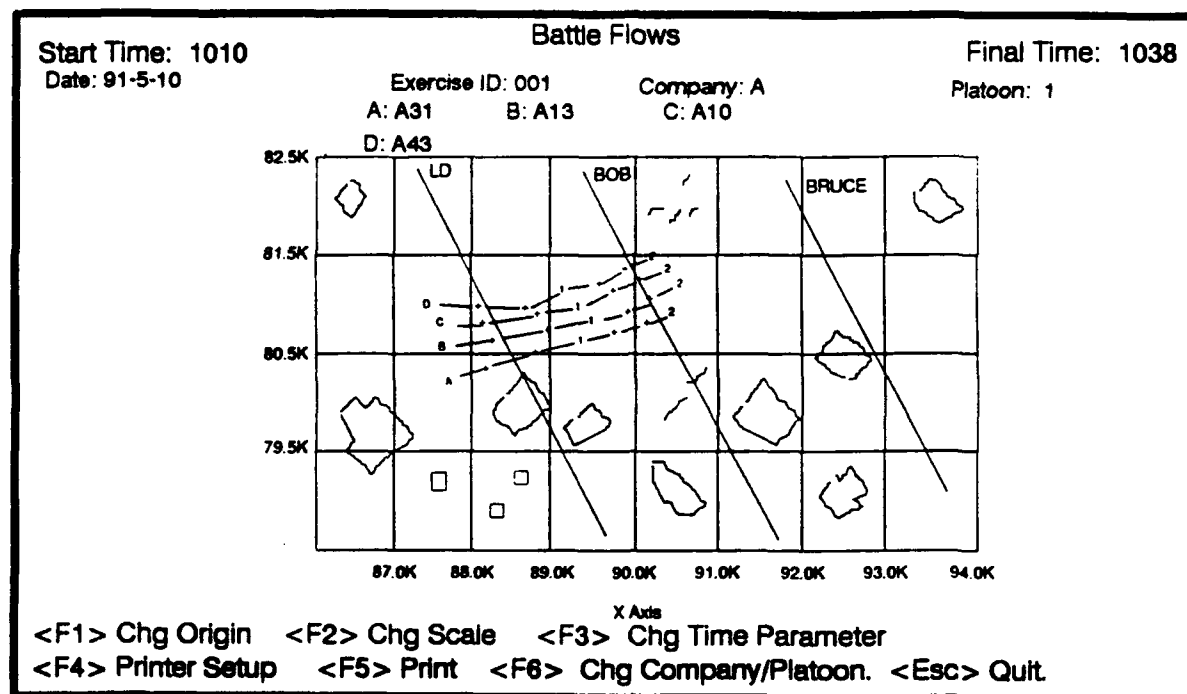
Figure 42. Battle Flow screen tracing the movement of a unit.

Figure 43. Screen allowing user tc make multiple changes in Battle Flow settings before regenerating a terrain map.

Changing the interval between position markers. The Battle
Flow uses two types of time markers, plus (+) signs and numerals,
to record the passage of time on the movement traces. In
general, you will mark positions with a plus sign at frequent
intervals and positions with a numeral at longer intervals. For
example, you can mark the location of a vehicle at one minute
intervals with a plus sign and at five minute intervals with a
numeral. In a long exercise you may want to use large intervals
to avoid cluttering the screen with too many plus signs and
numerals.

To change intervals or the starting time for the trace
when the Battle Flow is displayed on your screen, press the <F3>
key to reach the menu shown in Figure 44. To change the interval
at which positions are marked with plus (+) signs, use the arrow
 ~ys to select "Change Position Marker Interval" and press
    er>.

The screen for changing position marker intervals is shown
 ⊥   ʒure 45. The bottom of the next screen will indicate the
inⳑ .ʐal that is currently set, and higher up on the screen you
will be asked to type in the new interval using two digits. For
example, to mark the position of vehicles with a plus sign at
three minute intervals, you would typ 03 and press <Enter>. If
you decide you do not want to make a   ᵌange, press <Esc>.

The same procedure is used to change the interval between the
numeral time markers except that the option "Change Frequency of
Numerical Marker Intervals" is selected from the menu of interval
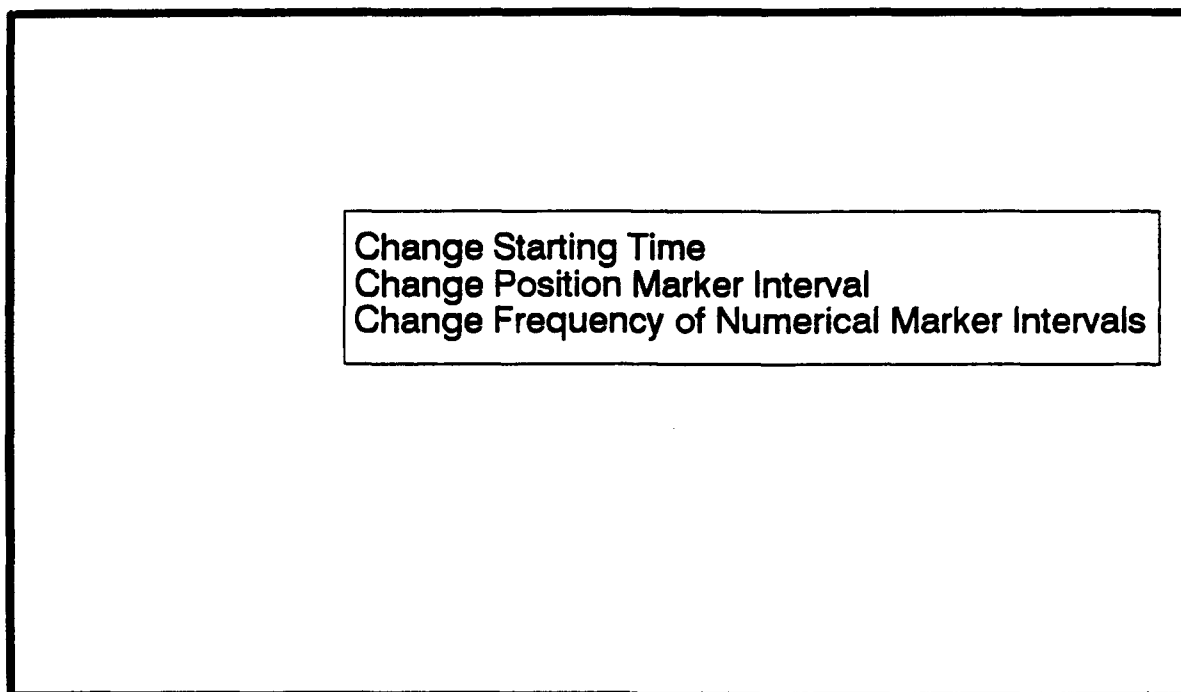and time changes shown in Figure 44.

Change Starting Time
Change Position Marker Interval
Change Frequency of Numerical Marker Intervals

Figure 44. Menu for making time and interval changes in the Battle Flow.

Enter New Position Marker Interval:
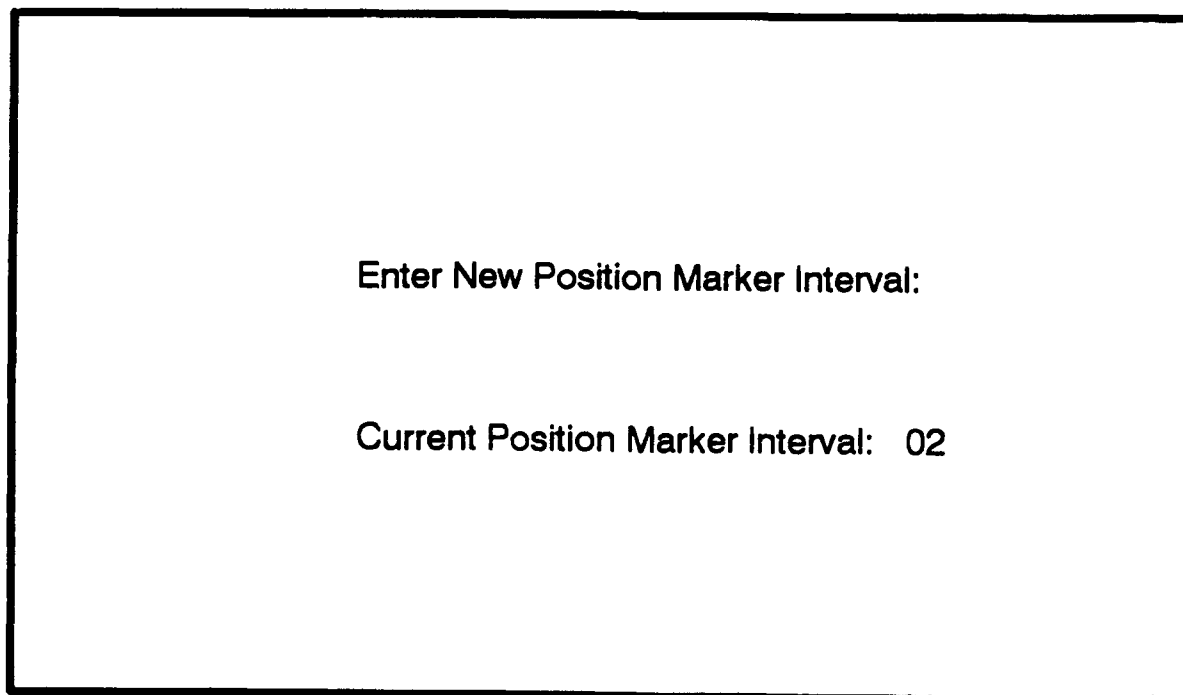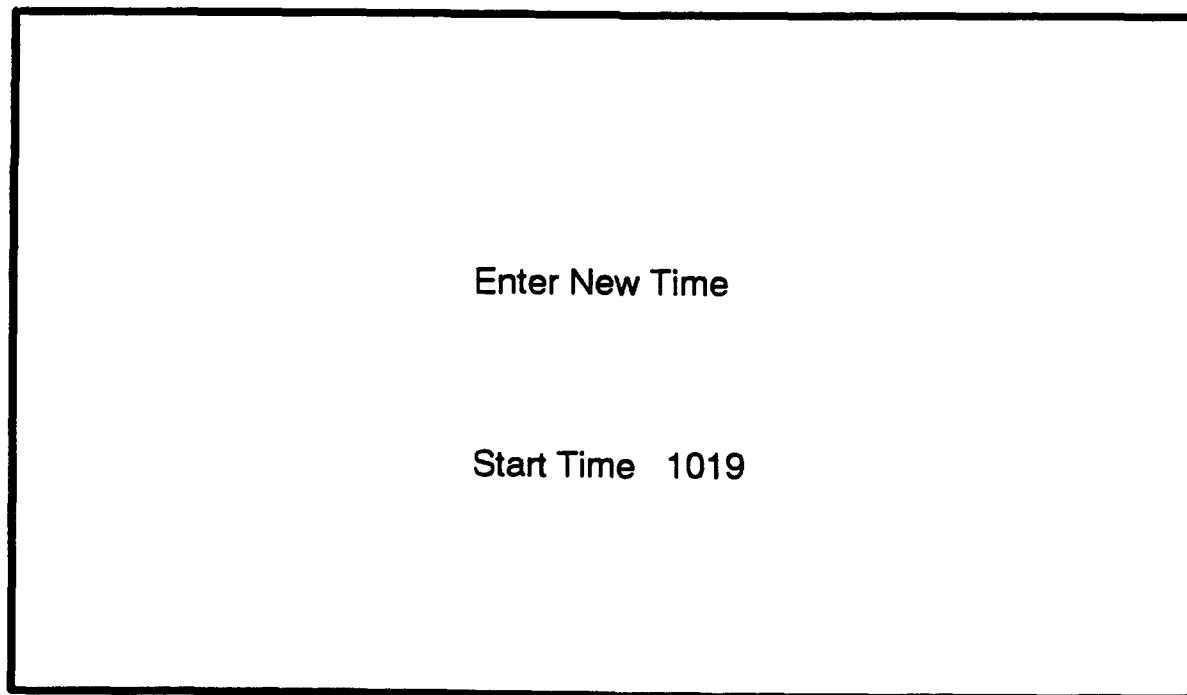
Current Position Marker Interval: 02

Figure 45. Battle Flow screen for changing position marker intervals.

Changing the starting time for a Battle Flow chart. The "Start Time" at the top of the Flow Chart by default lists the point in time when the exercise begins. The default time is the time when data collection for the exercise was initiated. You can change the start time by pressing the <F3> key to bring up the screen shown in Figure 44. Use the arrow keys to select "Change Starting Time" and press enter. The next screen, illustrated in Figure 46, will prompt you to type in the new starting time, such as 1035. The time listed at the bottom of the screen is the time when data collection for the exercise ended.

```
Enter New Time




Start Time   1019
```

Figure 46.   Screen for changing the start time for a Battle Flow Chart.

47

Changing the origin of the Battle Flow Chart. The procedures for changing the origin of a Battle Flow Chart to focus in on the vehicles of interest are the same as those used for the Plan View. These procedures are described on page 35.

Changing the level of magnification of the battlefield. You can also increase or decrease the portion of the battlefield shown in the Battle Flow to obtain a broader view of the battlefield or to magnify a portion of the battlefield. This option works by controlling the number of one kilometer by one kilometer blocks included in the display. The blocks included in the magnified display are measured from the origin. You should always make sure that the vehicles to be observed will fall within the new blocks to be displayed. This is accomplished by changing the origin before attempting to magnify the battlefield.

The procedures for changing the level of magnification of the battlefield for a Battle Flow are the same as those used for the Plan View. These procedures are presented on page 37.
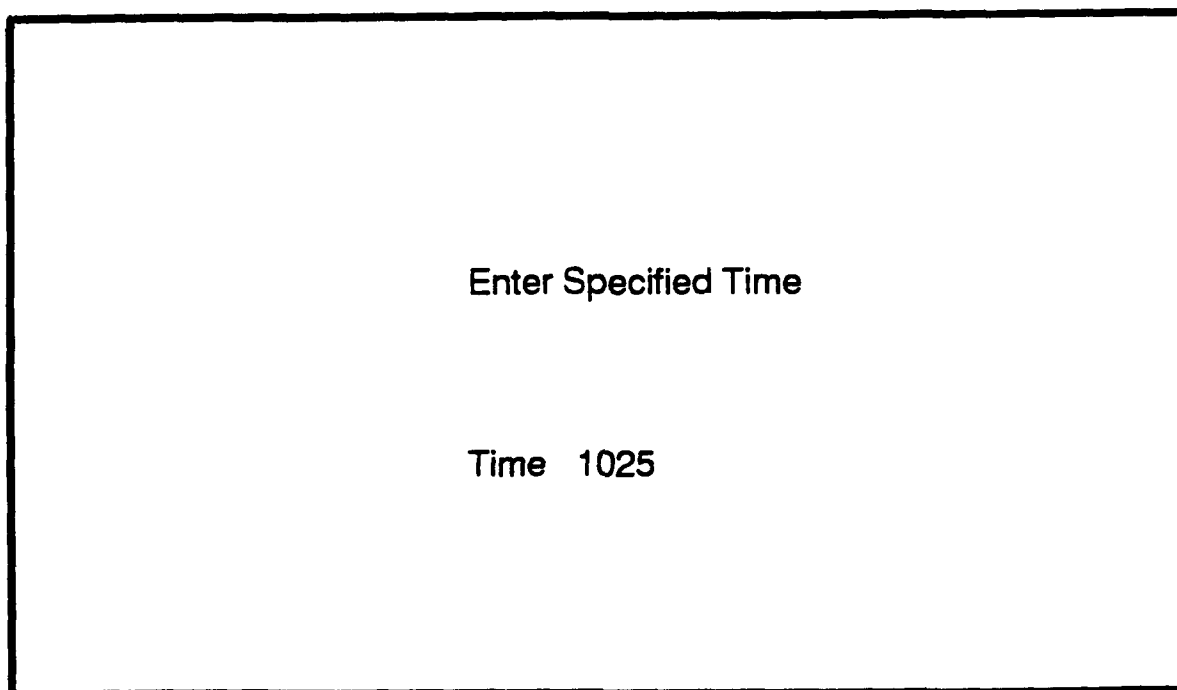
Printing a copy of a Battle Flow screen. Once you have set up your printer for use with one of the AAR aids, it is prepared to make copies of the other aids. The capability to make hard copies of UPAS screens is an especially valuable tool when applied to the Battle Flow. You can focus the trace on a small segment of a mission by controlling the start time and the end time for the trace.

Battle Snapshot

A Battle Snapshot is intended to provide a bird's-eye view of the battlefield at a specific point in time. You may select as many points in time to collect Snapshots as you feel necessary. For example, if a unit has been ordered to change from one formation to another as it crosses a phase line, you might want one Snapshot to be taken before the unit reaches the phase line and a second Snapshot afterward to compare unit formations.

Designating the Time for Battle Snapshots. Unlike the Plan View and the Battle Flow, the Snapshot function is not animated. Therefore, you will need to know the specific times for which Snapshots are to be taken before you enter the Snapshot utility. Such times may be obtained from notes taken during the exercise, from times of interest noted when reviewing the exercise on the Plan View or Battle Flow Displays, or they may be times set in operational orders before the exercise.

When you select the Battle Snapshot option from the After Action Review Menu, you will be prompted to select the company and platoon for which the Snapshot is to be prepared. You will then be prompted to type the time for the Snapshot as illustrated in Figure 47.

Enter Specified Time

Time 1025

Figure 47. Screen for designating the time during an exercise at which a Battle Snapshot is to be made.

Figure 48 is an example of a Battle Snapshot screen. The Snapshot allows you to change the origin of a display, the level of magnification of the display, and the point in time from the exercise that is to be addressed by a Snapshot. When you make any of these changes, the terrain map will need to be regenerated, and roughly a minute and a half is required to regenerate this map on your screen. To reduce the amount of time you spend waiting for the terrain map to be regenerated, a function has been built into the UPAS that allows you to make more than one change at a time. For example, if you select the option of changing the origin of a display, you will be given the opportunity to make other changes as well before the terrain map is regenerated. After you change any of the settings within the Battle Flow you will see the screen shown in Figure 49. Instructions for changing each type of setting are provided below.

Note that there are two different sizes of vehicle icons in Figure 48. The large icons represent BLUFOR vehicles and the small icons represent REDFOR vehicles.
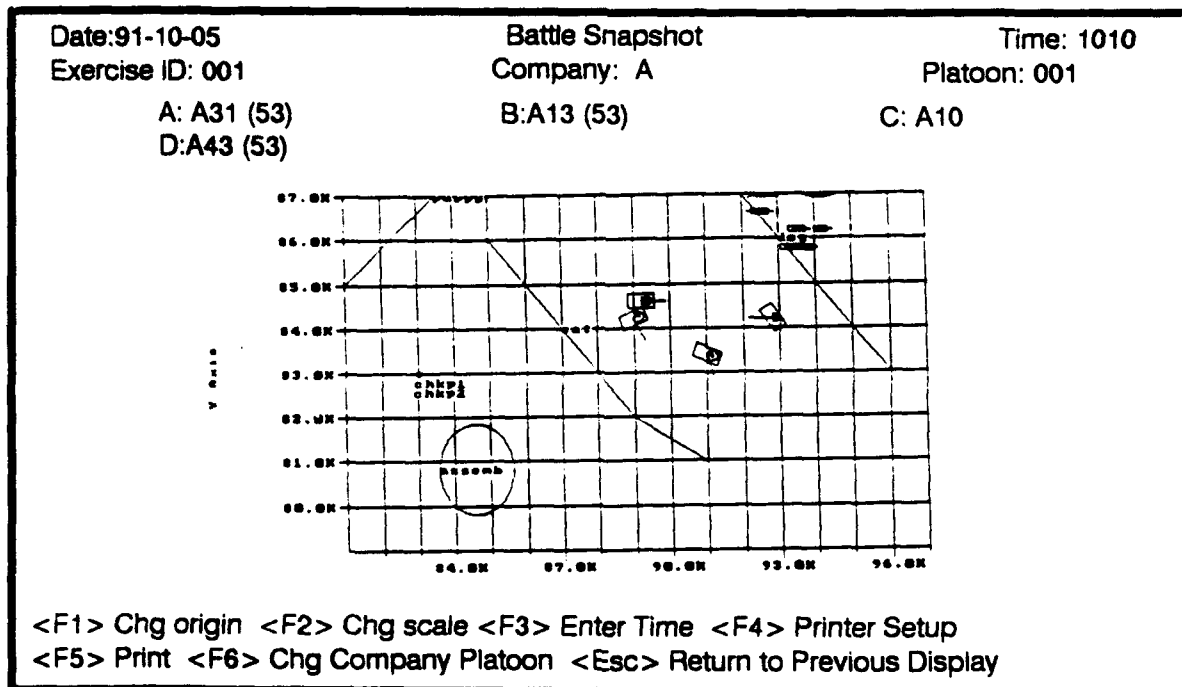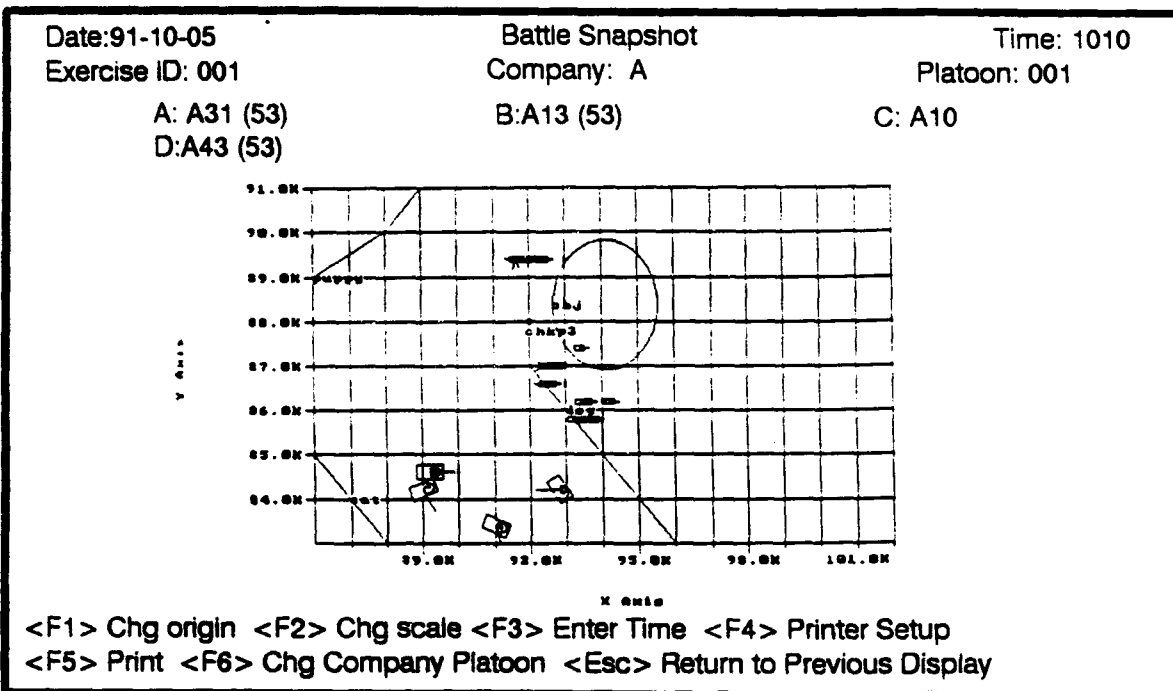

Figure 48. Battle Snapshot screen.

```
┌───────────────────────────────────────────────────────────┐
│  ┌──────────────────────────────────────────────────────┐ │
│  │                                                      │ │
│  ├──────────────────────────────────────────────────────┤ │
│  │                                                      │ │
│  │                                                      │ │
│  │                                                      │ │
│  │                                                      │ │
│  │          Please Enter Another Selection             │ │
│  │                                                      │ │
│  │                                                      │ │
│  │                                                      │ │
│  │                                                      │ │
│  │                                                      │ │
│  ├──────────────────────────────────────────────────────┤ │
│  │ <F1> Chang Origin.  <F2> Chang Scale.  <F3> Enter Time │ │
│  │ <F4> Printer Setup.  <F5> Chang Company/Platoon. <F6> Return to Display │ │
│  └──────────────────────────────────────────────────────┘ │
└───────────────────────────────────────────────────────────┘
```

Figure 49. Screen allowing user to make multiple changes in Battle Flow settings before regenerating a terrain map.
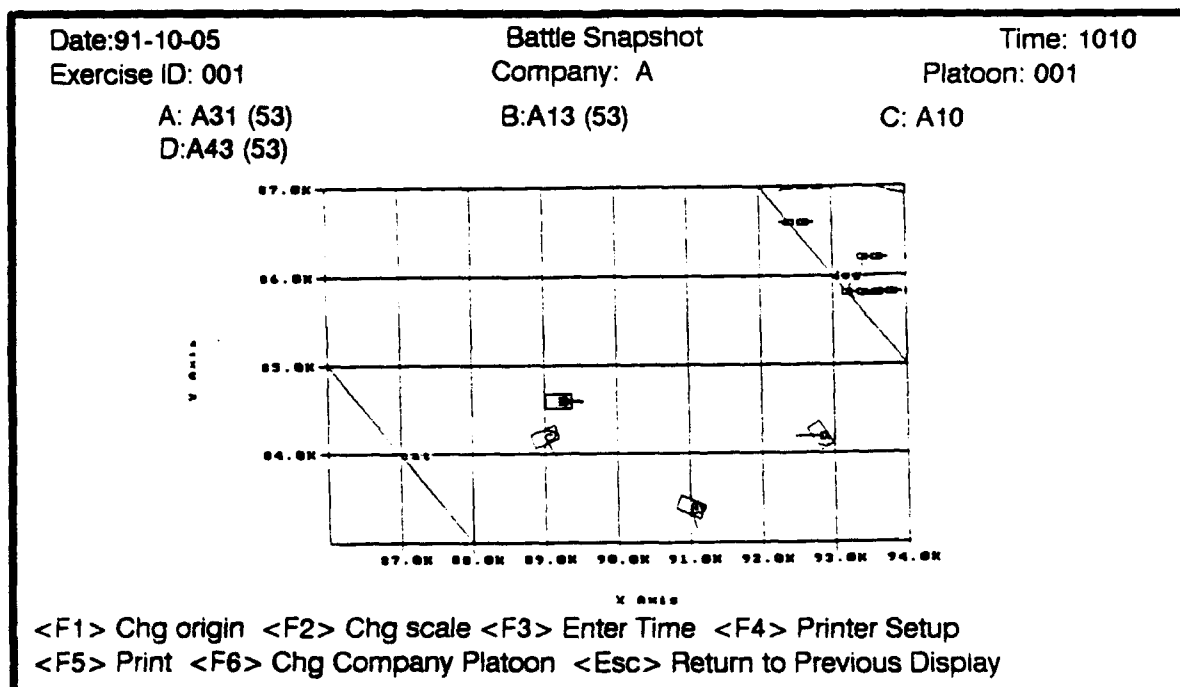

Changing the Origin of Battle Snapshots.   The procedures for changing the origin of a Battle Snapshot are the same as those used for a Plan View. These procedures are discussed on page 35.

Changing the level of magnification of the battlefield. You can also increase or decrease the portion of the battlefield shown in the Snapshot by controlling the number of one kilometer square blocks included in the display, as illustrated in Figure 50. The blocks included in the magnified display are measured from the origin. Again, you should check to make sure that the vehicles to be observed will fall within the new blocks to be displayed. This is accomplished by changing the origin as described immediately above.

The procedures for changing the scale or level of magnification of a Battle Snapshot are the same as those used for the Plan View. These procedures are described on page 37.

Date:91-10-05   Battle Snapshot   Time: 1010
Exercise ID: 001   Company: A   Platoon: 001

      A: A31 (53)   B:A13 (53)   C: A10
      D:A43 (53)

<F1> Chg origin <F2> Chg scale <F3> Enter Time <F4> Printer Setup
<F5> Print <F6> Chg Company Platoon <Esc> Return to Previous Display

(A)

Date:91-10-05   Battle Snapshot   Time: 1010
Exercise ID: 001   Company: A   Platoon: 001

      A: A31 (53)   B:A13 (53)   C: A10
      D:A43 (53)

<F1> Chg origin <F2> Chg scale <F3> Enter Time <F4> Printer Setup
<F5> Print <F6> Chg Company Platoon <Esc> Return to Previous Display

(B)

Figure 50. Battle Snapshot before (A) and after (B)
magnification.

52

Exercise Timeline

The Exercise Timeline describes firing and movement events as a function of time and control measures. The Timeline display helps to make more obvious how different kinds of events are related in time. It can also help to pick out interesting times for Battle Snapshots. When you select the Exercise Timeline option from the After Action Review Menu, the first two screens will ask you to select the company and platoon, respectively, to be addressed by the Timeline.

Figure 51 provides an example of an Exercise Timeline. The top and bottom lines cover the time during the exercise. The second line describes movement of the platoon as a function of time and unit control measures. The bars at the bottom of this line indicate the time when the first and last vehicle of a unit crossed a control measure. For Start, Release, and Check Points, vehicles within 50 meters of the point are considered to have crossed. For the Line of Departure and Phase Lines, vehicles must actually have crossed the line. Vehicles are considered to have departed the assembly area when they are 100 meters from its center, and vehicles are considered to have reached the objective when they are within 100 meters of its center. Disabled or destroyed vehicles are, of course, not included when computing the time when the first and last vehicle crossed a control measure. The Timeline also indicates the beginning and ending of periods in time when the entire platoon was halted.

The third line provides information about the time of direct and indirect firing events. The information provided about firing events is described below.

- A small square is used to indicate when the unit receives artillery fire (defined as any artillery or mortar mission within 50 meters of any vehicle within the unit)

- An arrow pointed down indicates when the first enemy direct fire was received by the unit, regardless of whether this fire resulted in a hit, kill, or miss.

- An arrow pointed up indicates when the unit first delivers fire on the enemy

- A small x indicates points in time when an enemy vehicle is destroyed

- A small circle is used to indicate a point in time when a friendly vehicle is destroyed.

The fourth line will provide information about the timing of communications over the tactical radio network. This feature is not yet implemented fully in the UPAS. The use of this feature will require that you maintain a log of radio messages during exercises and input these communications data at the end of the exercise. Once these feature is implemented fully, it can be used to assess whether units report critical information over the radio network.

SIMNET EXERCISE TIMELINE

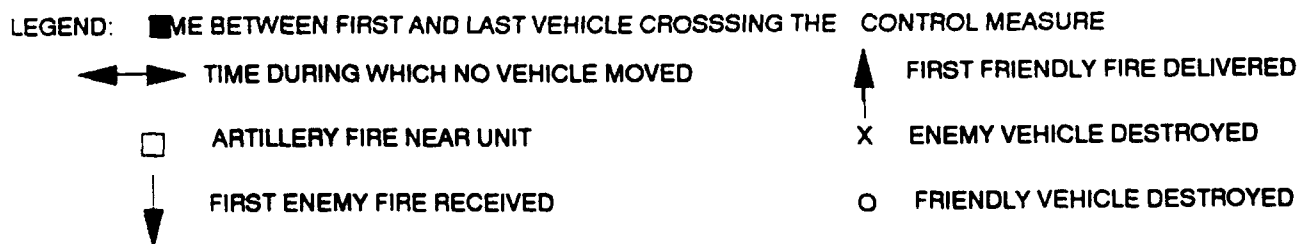EXERCISE ID: 001   DATE: 10/12/91   COMPANY: A

| 0930 | 40 | 50 | 1000 | 10 | 20 | 30 | 40 | 50 | 1100 | 10 |

PLT 1

MOVE   AA   LD   SNAKE   SERPENT   FROG

SHOOT

COMM

LEGEND: ▮ME BETWEEN FIRST AND LAST VEHICLE CROSSSING THE   CONTROL MEASURE

◄──► TIME DURING WHICH NO VEHICLE MOVED   ▲ FIRST FRIENDLY FIRE DELIVERED

☐ ARTILLERY FIRE NEAR UNIT   X   ENEMY VEHICLE DESTROYED

↓ FIRST ENEMY FIRE RECEIVED   O   FRIENDLY VEHICLE DESTROYED
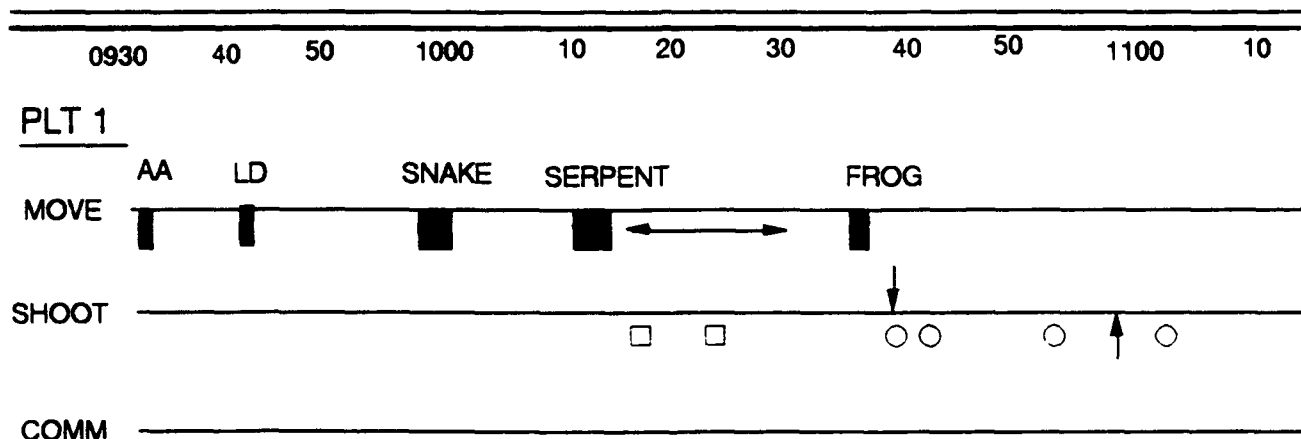
Figure 51.   Sample Exercise Timeline.

54

Battle Scorecard

Battle Scorecards summarize the effects of direct and supporting engagements over an entire exercise. To gain access to these scorecards, select the Battle Scorecard option from the Data Summary Menu. The next screen (see Figure 52) will provide a menu of two scorecard options. Examples of these scorecards are provided as Table 2 and Table 3.

Each of the scorecards requires approximately four minutes for generation the first time they are prepared for a particular exercise. Subsequently only about a minute is required to recall a table that has been generated previously.

What happens after you select a scorecard from the menu depends on whether the scorecard has been generated previously. If it has, then you will see a display like that shown in Figure 53. Simply press <Esc> to call up the table, unless you want to regenerate the table from scratch for some reason.

Battle Scorecard

Direct Fire Weapon System Summary

Fire Support Summary

Use up or down arrow keys to highlight selection.
<Enter> to accept.
<Escape> to return to Previous Menu

Figure 52. Battle Scorecard Menu screen.

Table 3. UPAS Direct Fire Weapon System Summary Table.

SIDE	FIRING WEAPON	FIRING AMMO	SHOTS	MBT_H	MBT_K	IFV_H	IFV_K	OTH_H	OTH_K	TOT_H	TOT_K
B	US M1	US M392A2 - 105mm/KP	95	4	4	0	1	0	0	4	5
		US M456A1 - 105mm/SCP	87	0	0	6	5	0	0	6	5
Total			182	4	4	6	6	0	0	10	10

SIDE	FIRING WEAPON	FIRING AMMO	SHOTS	MBT_H	MBT_K	IFV_H	IFV_K	OTH_H	OTH_K	TOT_H	TOT_K
B	US M2	US M791 - 25mm	197	2	0	1	3	0	0	3	3
Total			197	2	0	1	3	0	0	3	3

SIDE	FIRING WEAPON	FIRING AMMO	SHOTS	MBT_H	MBT_K	IFV_H	IFV_K	OTH_H	OTH_K	TOT_H	TOT_K
R	USSR T72M	US M392A2 - 105mm/KP	1	0	1	0	0	0	0	0	1
		US M456A1 - 105mm/SCP	1	0	0	0	0	0	0	0	0
Total			2	0	1	0	0	0	0	0	1

SIDE	FIRING WEAPON	FIRING AMMO	SHOTS	MBT_H	MBT_K	IFV_H	IFV_K	OTH_H	OTH_K	TOT_H	TOT_K
R	USSR_BMP2	US M791 - 25mm	155	3	0	0	0	0	0	3	0
Total			155	3	0	0	0	0	0	3	0
Overall total			536	9	5	7	9	0	0	16	14

Table 4. Fire Support Summary Table.

SIDE	FIRING WEAPON	FIRING AMMO	SHOTS	MBT_H	MBT_K	IFV_H	IFV_K	OTH_H	OTH_K	TOT_H	TOT_K
B	US M106A1	US M329 - 107mm/HE	95	4	4	0	1	0	0	4	5
		US M107 - 155mm/HE	87	0	0	6	5	0	0	6	5
Total			182	4	4	6	6	0	0	10	10

SIDE	FIRING WEAPON	FIRING AMMO	SHOTS	MBT_H	MBT_K	IFV_H	IFV_K	OTH_H	OTH_K	TOT_H	TOT_K
B	US M109	US M107 -155mm/HE	197	2	0	1	3	0	0	3	3
Total			197	2	0	1	3	0	0	3	3

SIDE	FIRING WEAPON	FIRING AMMO	SHOTS	MBT_H	MBT_K	IFV_H	IFV_K	OTH_H	OTH_K	TOT_H	TOT_K
R	USSR M1943	US M329 - 107mm/HE	1	0	1	0	0	0	0	0	1
		US M107 - 155mm/HE	1	0	0	0	0	0	0	0	0
Total			2	0	1	0	0	0	0	0	1

SIDE	FIRING WEAPON	FIRING AMMO	SHOTS	MBT_H	MBT_K	IFV_H	IFV_K	OTH_H	OTH_K	TOT_H	TOT_K
R	USSR_2S1-122H	US M107 -155mm/HE	155	3	0	0	0	0	0	3	0
Total			155	3	0	0	0	0	0	3	0
Overall total			536	9	5	7	9	0	0	16	14

```
┌────────────────────────────────────────────────────────┐
│                                                        │
│                                                        │
│     ┌──────────────────────────────────────────┐       │
│     │                                          │       │
│     │   Type Any Key to Regenerate Battle Scorecard │   │
│     │                                          │       │
│     │   Typ <Esc> to Display Existing Battle Scorecard │ │
│     │                                          │       │
│     ├──────────────────────────────────────────┤       │
│     │        Table    Already    Exists        │       │
│     └──────────────────────────────────────────┘       │
│                                                        │
│                                                        │
│                                                        │
└────────────────────────────────────────────────────────┘
```
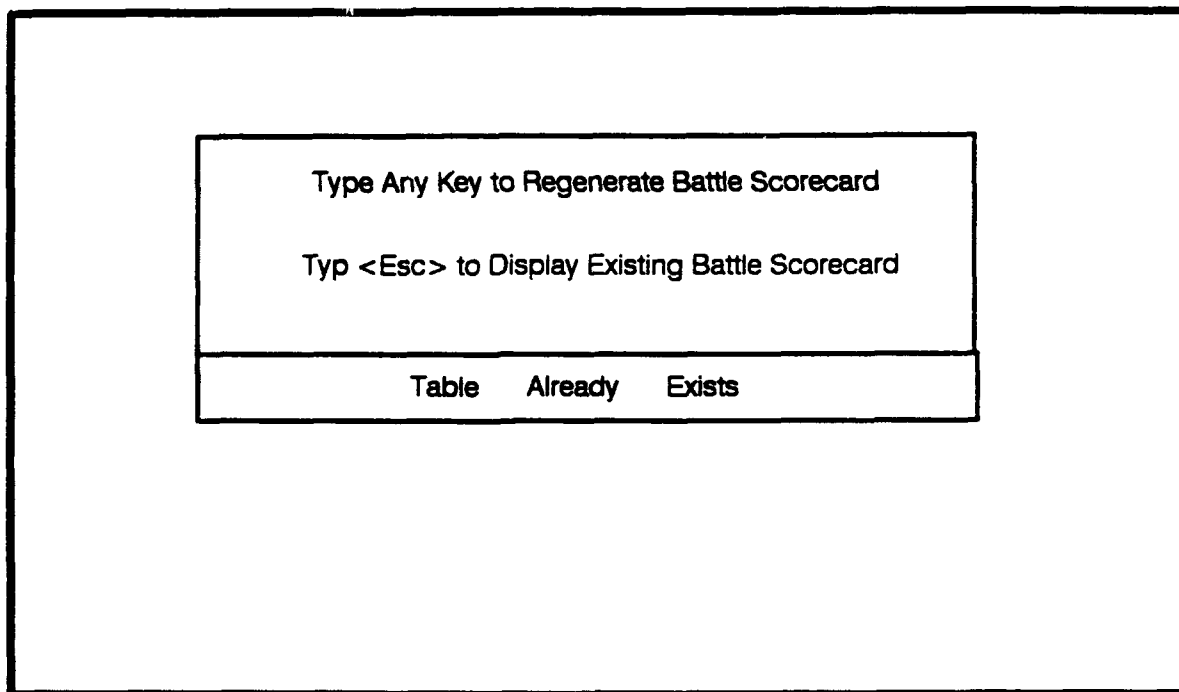
Figure 53. Screen displayed when a Battle Scorecard has already
been generated for exercise data.

        To print a copy of a Battle Scorecard when it is displayed
on your screen, press <F2>.   To exit from a scorecard, press
<Esc> and then type "y".

UPAS Utilities Menu

When you select the Utilties option from the UPAS main menu, the screen shown in Figure 54 will appear. The graph editor and table editor options are used to create or modify the tables and graphs contained in the menus of graph and table options described on pages 26 through 30. Instructions for using these editors are provided in the UPAS Advanced User's Guide.

```
+-----------------------------------------------------------+
|                                                           |
|                        Utilities                          |
|                                                           |
+-----------------------------------------------------------+
|                                                           |
|                    Set Data Path                          |
|                    File - Floppy Disk                     |
|                    File - Tape                            |
|                    Summary Graphics Editor                |
|                    Summary Text Table Editor              |
|                                                           |
|                                                           |
|                                                           |
+-----------------------------------------------------------+
|   Use up or down arrow keys to highlight selection.       |
|   <Enter> to accept.                                      |
|   <Escape> to return to Main Menu                         |
+-----------------------------------------------------------+
```

Figure 54. UPAS Utilities Menu screen.

Selecting the Data Path for Backing Up and Restoring Exercise Data

Use the arrow keys to select "Utilities" from the UPAS menu and press <Enter>. When the Utilities Screen appears, use arrow keys to select the "Set Data Path" option and press the <Enter> key. The option for setting the data path works the same as the option by that name on the Data Collection menu (see page 10).

The Set Data Path Screen prompts you to type in the name of the data path. Your response to this prompt depends on whether you are backing up or restoring data.

- If you are preparing to back up a file to tape, the name of the UPM subdirectory to be backed up should be typed at the prompt. For example, if the exercise files are called "SIM1", then you should type \UPM\SIM1 and press the <Enter> key.

- If you are preparing to restore an exercise file from a tape or from floppy disks you should name the directory into which the data are to be loaded. This directory should match that of the name of the directory on the tape that is to be restored. For example, if you had previously backed up the SIM2 subdirectory of UPM on tape or disks, and you wanted to restore this subdirectory, you would type \UPM\SIM2 in response to the prompt.

The instructions for setting the data path are the same regardless of whether floppy disks or a tape drive are employed. After UPAS gives you the message that the path has been set, press the <Escape> key to return to the Utilities Menu.

Restoring and Backing Up Data

The display in Figure 55 will appear on your screen after you select the "File - Floppy Disk" option from the Utilities Menu. A similar menu will appear if you select the "File - Tape" option from the Utilities Menu. Instructions are provided below for using the floppy disk options and tape options.

Using a Floppy Drive to Back Up and Restore Exercise Data

If you select the Save Exercise Data option, the next screen will instruct you to "insert backup source disk in drive C" and "press any key to continue." The only action you need to take is to press any key to move on to the next screen. The subsequent screen will instruct you to "insert backup diskette 01 in drive A." Each time that UPAS has filled the disk in the A drive with data, it will prompt you to insert a new disk. The drive identified as Drive A on your comuter is the only floppy drive that you can use to back up or restore exercise data with UPAS.

```
┌─────────────────────────────────────────────────────────────┐
│                                                               │
│                      File - Floppy Disk                       │
│                                                               │
├─────────────────────────────────────────────────────────────┤
│                                                               │
│                                                               │
│            Save Exercise Data to Floppy Disk                  │
│                                                               │
│            Load Exercise Data from Floppy Disk                │
│                                                               │
│                                                               │
│  ,                                                            │
│                                                               │
│                                                               │
├─────────────────────────────────────────────────────────────┤
│  Use up or down arrow keys to highlight selection.            │
│  <Enter> to accept.                                           │
│  <Escape> to return to Previous Menu                          │
└─────────────────────────────────────────────────────────────┘
```

Figure 55. File - Floppy Disk Menu screen.

        If you select the Load Exercise Data option, on screen
prompts will be used to tell you when to insert floppy disks in
drive A. Once again, you must use drive A with UPAS when backing
up or restoring data using a floppy disk drive.

Using a Tape-Drive to Back Up and Restore Exercise Data

        UPAS includes an interface with the Mountain Tape Drive
system so that many of the steps you would perform when backing
up data on a tape or restoring data from a tape are performed for
you. Select the option "File-Tape" from the Utilities Menu and
press the <Enter> key.

        If you wish to save exercise data on tape, select the first
option from the File-Tape Menu.   UPAS will then call up the
Mountain Tape Drive, and the next screen you see will be the
Backup Screen from this system. This screen will ask if you want
to proceed with the backup. Type the letter "y", and the system
will return you to the Tape-Drive Menu when the backup is
complete.

If you wish to restore exercise data, select the second option from the File-Tape Menu.   UPAS will then call up the Mountain Tape Drive system, and the next screen you see will be the Selective Restoration Screen from this system.   The Mountain System will then ask if you want to proceed.   Type the letter "y", and the system will return you to the Tape-Drive Menu when the data have been restored.

Overview of the Performance Measurement and
NTC Archive Database Options

Procedures for using the Performance Measurement and NTC Archive Database options from the UPAS Main Menu are provided in the Advanced UPAS User's Guide. These are tools for research and training development that are being used to improve the quality of feedback provided by the UPAS. Each of these tools is described briefly below.

The NTC Archive Database function allows the user to analyze exercise data loaded into the SIMNET/NTC database using Structured Query Language (SQL). This feature makes it possible to examine data in ways that are not covered by the menus of tables and graphs already contained within the UPAS. This feature can also be used in conjunction with UPAS graph and table editors to add new tables and graphs to these menus.

The NTC Archive Database contains data tables patterned after those used to archive data from NTC exercises. The UPAS tables differ from the NTC tables in that they contain certain types of information that are automatically collected from SIMNET exercises. For example, both the NTC archives and the SIMNET/NTC database contain a table called the Ground Player Location Table that contains time-tagged data on vehicle locations throughout an exercise. The SIMNET version of the table contains additional information about each vehicle including the amount of fuel and ammunition available, the speed of the vehicle, the engine speed, and the odometer reading. A complete list of the time-tagged data in the UPAS NTC Archive Database is presented in Table 5.

The UPAS Performance Measurement system allows the user to link unit performance standards to specific UPAS data sources (graphs, tables, Plan View, Battle Flow, Battle Snapshot, Exercise Timeline, and Scorecards) that can be used in deciding whether a unit met each standard. Figure 56 shows a Performance Measurement Screen that allows the user to call up the data sources that can be used for a sample standard. In many cases more than one measure of performance might be used to assess unit performance with respect to standard, and the link with data sources is actually made through measures of performance. Note that the user can also record the results of the application of the standard.

The Performance Measurement system is a flexible system that can be easily modified in response to lessons learned about measuring unit performance. Tools built into the Performance Measurement System allow the user to change tasks, standards, measures of performance, and data sources in response to lessons learned.

TABLE 5. EXERCISE DATA CONTAINED IN THE UPAS NTC ARCHIVE DATABASE

Direct Firing Events

- Time of firing event
- ID of firing vehicle and target vehicle
- Type of weapon system and type of ammunition employed
- Location of firing vehicle and target vehicle expressed in terms of X-Y-Z UTM grid coordinates and in terms of polar coordinates
- Range of engagement
- Results of engagement expressed as a hit, kill, or miss
- Identification of firing events that are fratricidal

Vehicle Location and Status

- Time of vehicle location or vehicle status update
- ID of vehicle
- Location of vehicle expressed in terms of X-Y-Z UTM coordinates and in terms of relative coordinates
- Speed of movement
- Odometer reading
- Number of liters of fuel remaining
- Rounds of ammunition remaining
- Direction of movement
- Turret azimuth
- Operational status of vehicle (fully operational, destroyed, communication loss, or mobility loss)

Indirect Firing Events

- Time of indirect fire missions
- Type of shell employed
- Number of rounds employed
- Location of target
- Result of engagement

```
                              Evaluate Task

Company A/Platoon 1
Conduct Assault

┌─────────────────────────────────┐          ┌─────────────────────────────────┐
│ Task 33                         │          │ Performance Standard:           │
├─────────────────────────────────┤          ├─────────────────────────────────┤
│ Unit suppresses enemy fires.    │          │ Execution of the assault        │
│                                 │          │ effectively destroys the        │
│                                 │          │ enemy's capability to fight.    │
└─────────────────────────────────┘          └─────────────────────────────────┘


┌─────────────────────────────────┐          ┌─────────────────────────────────┐
│ MOP Type: Automated             │          │ MOP Comments                    │
├─────────────────────────────────┤          ├─────────────────────────────────┤
│ Number of rounds                │          │                                 │
│ fired by each side              │          │                                 │
│ over time                       │          │                                 │
└─────────────────────────────────┘          └─────────────────────────────────┘
┌──────────────────────┬──────────┐          ┌──────────────┬──────────────────┐
│ MOP Display Format:   │  Table   │          │ Rating:      │                  │
└──────────────────────┴──────────┘          └──────────────┴──────────────────┘

Use arrow keys to View MOPs. Use Page UP/Dn keys to Advance to next Performance.
<F1> to Evaluate Automated MOP. <F2> Edit Comments.  <F3> Edit Rating.
<Esc> for previous menu.
```

Figure 56.   UPAS Performance Measurement Screen.

Applying the UPAS to Unit Performance Measurement

Rules of Thumb for Applying UPAS Data Summaries to Unit Performance Measurement

Table 6 is a matrix that relates categories of performance measures to each type of AAR aid (including graphs and tables). This table is provided as a general guide in deciding which types of measures might be applied most effectively with each type of aid. The table was prepared under the assumption that communications data will soon be integrated into the Exercise Timeline. These categories of performance measures are described below with examples taken from the Mission Training Plans for Armor Platoons.

TABLE 6. CATEGORIES OF STANDARDS APPROPRIATE TO EACH TYPE OF AAR AID

CATEGORY OF STANDARDS	AAR AID FORMAT				
	TABLES/ GRAPHS	FLOW CHART	SNAPSHOT	PVD	TIMELINE
MOVEMENT AND FIRING EVENTS				●	●
FRIENDLY AND ENEMY FIRES	●			●	
MOVEMENT AND CONTROL MEASURES		●	●	●	●
MOVEMENT TECHNIQUE AND METT-T		●	●	●	●
MOVEMENT AND COVER/CONCEALMENT		●	●	●	
WEAPON ORIENTATION			●	●	
HALTS AND COVER/CONCEALMENT		●	●	●	●
LOCATIONS OF FRIENDLY INDIRECT FIRE AND ENEMY POSITIONS		●			
SPATIAL RELATIONSHIPS AMONG MOVING VEHICLES		●	●	●	
RATE OF MOVEMENT		●		●	●
LOCATION, CONTROL MEASURES, AND COMMUNICATIONS					●
FIRING EVENTS AND COMMUNICATIONS					●

Types of Unit Performance Measures

<u>Friendly movement cued by enemy or friendly firing events</u>. These standards are used to assess whether a unit takes appropriate movement actions when fired upon. The initial and subsequent movement responses to enemy fires are a function of the overall METT-T situation. This category of standards also addresses the coordination of friendly movement with friendly covering fires across a wide range of tactical situations. Examples of performance measures under this category from the platoon task "Perform Platoon Fire and Movement" are as follows.

- Plt ldr moves out of kill zone and seeks better cover and concealment.

- Each vehicle moves to alternate firing positions as necessary.

- Plt ldr repositions the Platoon to gain an advantage over the Threat and maximize opportunities for flank shots against Threat tanks.

<u>Friendly Firing Events Cued by Enemy Firing Events</u>. The standards within this category assess how well a unit controls its volume and distribution of fires in response to enemy firing events. Do units promptly return fire? Do units adjust volume and distribution of fires in response to changes in volume of enemy fires? Examples of standards in this category from the task "Perform an Attack by Fire" are listed below.

- The platoon increases and decreases the rate of fire depending on METT-T.

- Plt ldr redirects, adjusts, or concentrates fires on Threat forces displacing, moving to alternate firing positions, or moving in as reinforcements.

- Plt ldr requests shifting/lifting of supporting direct and indirect fires as necessary.

<u>Compliance of Movement with Control Measures</u>. These standards are used to assess how well a unit's movement techniques, routes, and movement rates match the unit's operations order. Do units initiate movement and cross control measures as designated in the operations order? Do units employ appropriate movement techniques or formations as a function of control measures designated in the unit operations order. The examples below were taken from the task "Conduct a Tactical Road March."

- Follows the prescribed route of march, without deviation.

- Crosses SP within one minute of designated time without stopping or exceeding the catch-up speed specified in the OPORD or FRAGO.

Appropriateness of movement techniques as a function of the METT-T situation. These standards are used to assess whether the movement techniques employed by the unit are appropriate to the METT-T situation throughout the exercise. The following standards are from the tasks "Execute a Line Formation" and "Execute a Vee Formation", respectively.

- Terrain is open, maximum fire power forward is essential, and the platoon must assault a position, cross a danger area, or move on-line to occupy a defensive overwatch.

- Excellent protection and control are required, but maximum fires to the front are not necessary. Sufficient space exists for lateral dispersion of the lead section.

Use of cover and concealment during movement. This category of standards addresses the cover and concealment offered by the overall route of advance of a unit. It also addresses the cover and concealment afforded by short movements, such as the route from a battle position to an alternate firing position. The standards below are from the task "Displace to a Subsequent Battle Position."

- Plt ldr designates covered and concealed routes in and out of the BP to subsequent positions.

- Tank commanders select covered and concealed routes between primary, alternate, and supplementary firing positions.

Orientation of Weapon Systems as a Function of the METT-T Situation. This category covers two subcategories. The first assesses whether the orientation of the gun tube of each vehicle is appropriate given the METT-T. This second addresses the issue of whether each crew continually scans its assigned sectors or areas of responsibility as indicated by gun tube movement. The following standards are taken from the task "Execute a Herringbone Formation."

- Lead tank orients main gun toward the column's direction of travel.

- Trail tank main gun orients opposite to the direction of travel.

- Other tanks orient main gun toward the flank of the column corresponding to their direction of travel after exiting the route.

69

Halts and cover/concealment. These standards are used to assess the use of cover and concealment in selecting halt positions. In the context of offensive missions, these positions include overwatch positions selected prior to actual contact and firing positions. In the context of defensive missions, they include primary, alternate, and supplementary firing positions. The following standards are from the tasks "Take Actions at an Obstacle" and "Execute a Herringbone Formation", respectively.

- Plt ldr establishes an overwatch position at the last covered and concealed position on the friendly side of the obstacle.

- Each tank commander occupies covered and concealed positions.

Locations of friendly indirect fire relative to enemy location. Some standards in this category are concerned with using indirect fire on known enemy locations, while others are concerned with using indirect fire on likely enemy locations. The standards below are from the task "Assault an Enemy Position."

- Plt ldr initiates indirect fires to suppress known or suspected Threat forces on or within range of the objective.

- Plt ldr lifts and shifts indirect fires beyond the objective.

Spatial Relationships Among Moving Vehicles. This category of standards assesses the quality of movement techniques used by a unit, the location of the Platoon Leader's and Platoon Sergeant's vehicles relative to other vehicles, and whether an appropriate interval is maintained among vehicles. The following standards are from the task "Execute a Wedge Formation."

- Plt ldr positions himself at either the 1 o'clock or 11 o'clock position where he can best control his platoon and according to his SOP.

- The PSG positions himself opposite the plt ldr at either the 11 o"clock or 1 o'clock position.

- The wingmen take up positions behind and to the outside of their respective section leader.

- Each tank commander maintains his tank's interval and speed in accordance with METT-T, platoon SOP, and plt ldr's guidance.

Rate of Movement. This category of standard addresses movement rates over both short and longer periods of time. Movement rates over very short periods (a few seconds) are examined to assess a unit's response to an actual threat situation (i.e., moving quickly and continuously to a covered and concealed position) or to assess if vehicles move continuously at critical points in time to avoid blocking the movement of other vehicles (such as when a unit is moving into an assembly area or shifting from one formation to another). The following standards are from the task "Perform Assembly Area Activities."

- Vehicles move off the route of march without stopping or blocking traffic.

- Vehicles slow movement but do not stop or block traffic (as they occupy the assembly area).

Reporting of locations in terms of control measures. These standards are concerned with assessing whether a unit reports to a higher headquarters when it reaches key locations or takes a required action at a key location. The following standards were taken from the task "Conduct a Tactical Road March".

- Reports crossing of the SP on time, as required in the company team OPORD or FRAGO.

- The plt ldr reports all graphic control measures within one minute of crossing, as required by the company team OPORD or FRAGO.

Reporting of enemy contact and firing events. This category is concerned with assessing whether a unit reports initial contact, casualties inflicted, and casualties sustained. The standards listed below are from the task "Execute Actions on Contact".

- Reports if the threat has been destroyed.

- Reports if the platoon needs assistance to destroy or suppress the Threat force.

71

Appendix A:
UPAS Hardware and Software Requirements

Computer

The Unit Performance Assessment System (UPAS) will run on an IBM AT or compatible computer with a VGA adapter and monitor. Due to the need to process information quickly after an exercise, it is recommended that UPAS be employed on a system running at 25 megahertz. It is also strongly recommended that at least four megabytes of expanded memory be added to the basic system through the use of RAM expansion boards compatible with your system. The system should also include a 150 megabyte, or higher, hard disk.

Internal Tape Drive

Due to the large amount of data produced during the SIMNET exercise. To insure compatibility with the systems of other trainers and researchers working with UPAS, the tape drive controller must be type QIC-02 using 150 megabyte tapes. In order for the utilities in UPAS to directly interface with your internal tape drive, you should use Model Number 7150 from Mountain Computer, Inc. (Address: 240 Hacienda Avenue, Campell, CA 95008-6687; Telephone 408-379-4300).

Ethernet Board

The ethernet board used to connect the UPAS to SIMNET network is a 3COM Board 503.

Printer

Any printer that supports the Epson MX, Epson FX, Epson LQ, Hewlett Packard LaserJet, or Hewlett Packard Ink Jet interfaces can be used.

Commercial Software Packages

The UPAS employs the XDB relational database management system from XDB System, Inc (Address: 7309 Baltimore Avenue, College Park, Maryland 20740; Telephone: 301-779-6030). UPAS is designed to run with the XDB DBMS Version 2.30 with the XDB-XM option.

UPAS Software

UPAS software includes executable code and a SIMNET terrain database. The current terrain database addresses the Fort Knox training area. It is composed of a single 32.7 megabyte file called "Knox".

Modifying Config.sys and Autoexec.bat Files

The "config.sys" file should read as follows:

```
BREAK=ON
BUFFERS=20
FILES=50
SHELL=C:\DOS\COMMAND.COM C1\DOS\ /E:800 /P
INSTALL=C:\DOS\SHARE.EXE
REM DEVICE=C:\DOS\ANSI.SYS
```

The "autoexec.bat" file should read as follows:

```
REM PATH C:\BIN;\MSC5\BIN;\DOS;\;\BN\UT;\BN\NU;\BN\MISC;
\BN\DB;\BAT;\1BN;\UPM\XDB;
PATH \MSC5\BINB;\MSC5\BIN;\DOS;\;\BN\UT;\BN\NU;\BN\DB;
BAT;\UPM;\XDB;\MTN_TAPE
SET COMSPEC=C:\DOS\COMMAND.COM
REM \BN\UT\DOSEDIT
@SET ROOTDIR=C:
@SET CD PATH=.;\
@SET LIB=C:\MSC5\LIB
#SET LIB=C:\MASM\INCLUDE
@SET INCLUDE=C:\MSC5\INCLUDE;C:\UPAS\INCLUDE;
C:\UPAS\INCLUDE\PFORCE
#SET INCLUDE=C:\MASM\INCLUDE
@SET TMP=C:\TMP
@SET TMPDIR=C:\TMP
@SET TEMP=C:\TMP
@SET INIT=C:\MSC5\INIT;
@SET HELPFILES=C:\MSC5\HELP\*.HLP
@SET QH=C:\MSC5\HELP
#@ EXINIT=SET NU...USE EX.RC TO SET THIS
@SET XDBCFG=C:\XDB
```

Loading UPAS Software

UPAS executable code combined with the "Knox" terrain database file requires over 50 megabytes of memory. Therefore, the most reasonable way to load UPAS on your hard drive is to copy it from a tape using your internal tape backup system. Two directories must be loaded; the UPM directory containing the executable code and the TDB directory containing the terrain database.

Appendix B

UPAS Data Files

The UPAS directory, \upm\ddds, contains database files which are database definition templates for UPAS database tables. Most of these files are XDB system files maintained and used only by XDB and need not concern the user. Files with the extension ".tab" are the database files for the corresponding tables in the relational database. For instance, the database file for the firing event table (FET) is called FET.TAB. Index files are suffixed by ".IDX" with PVWT.IDX, for example, being the index file for PVWT table. These database files define all the fields in the records for the UPAS database tables. The use of these database files are transparent to the user who never has to modify or delete any of them directly.

Each UPAS exercise is assigned a specific UPAS directory, the name of which is selected by the user. For example, the user might select \upm\fnsim3 for a particular exercise. If that directory does not already exist, the system will create that directory and copy all the template files from \upm\ddds into this newly created directory. Note that the database still contains no exercise specific data up to this point until exercise data has been collected and data conversion has been performed on the collected data.

The following database tables contain exercise specific data inserted by the UPAS data conversion module.

- The Mission Identification Table (MID) contains information about the mission's date, starting time, and ending time.

- The Player State Initialization Table (PSIT) contains the vehicle ID, bumper number, vehicle code, and side for each vehicle.

- The Ground Player Position Location Table (GPLT) contains information about the status of each vehicle as a function of time.

- The Firing Event Table (FET) contains information about each direct fire event, such as the time, firer's vehicle ID, firer's location, weapon type, and ammunition.

- The Indirect Fire Mission Table (IFMT) contains information about each indirect fire (e.g. mortar, howitzer) firing event, including the time, the firer's vehicle ID, target location, weapon type, and ammunition used.

- The Paired Event Table (PET) contains information about ground and vehicle impacts of each weapon system projectile, including time of the firing event, firer's vehicle ID, firer's location, target location, target vehicle's ID if hit, weapon type, ammunition used, firing range, and result of impact.

- The Indirect Fire Casualty Table (IFCT) contains information about each indirect fire casualty, including time, firing vehicle's ID, target vehicle's ID, and target location.

Some of the tables contain constant data and are not specific to each exercise, as described below.

- The Player/Vehicle/Weapon Code Table (PVWT) is a translation table that translates the vehicle code into the corresponding vehicle type string and the weapon code into the corresponding weapon type string.

- The Menu Table (MENU) defines the menu prompts used in certain UPAS menus and the return codes to be returned from the menu when the user selects the corresponding menu choices.

There are some tables which contain information entered by the user by running some of the UPAS modules. These information are not broadcasted by the network and are thus not part of the collected data. They are listed below.

- The Control Measure Table (CMT) contains the names and coordinates of the control measures entered by the user by running the UPAS's Control Measure Module.

- The Platoon Organization Table (PLTORG) contains the vehicle IDs for each platoon and company involved in the exercise. This information is entered by the user using the Platoon Organization Module.

- The Graph Table (GRAPH) defines the titles of UPAS graphs and legends used for the x and y axis of each graph.

- The Inter Table (INTER) also contains information used to define the sequence of menus to which a user must respond when using UPAS graphs. This information is entered when using the UPAS Graph Editor Module.

- The SQL Query Command Table (SQL) contains the query commands used by the UPAS Table and Graph Modules. These query commands are used to retrieve the required information prior to displaying the corresponding tables and graphs. The query commands for the various tables and graphs can be defined by the user by running the UPAS Table Editor and Graph Editor Modules.

Besides the XDB database table files, there are some other files suffixed by ".DAT". These files provide intermediate data storage for the UPAS modules and their use are transparent to the user. The ".DAT" files are listed below:

- The "$upm.dat" file contains the raw data packets collected over the simulation network.

- The "$min.dat" file defines the position of the data packets in "$upm.dat" which are spaced one minute apart in time.

- The "convert.dat" file contains information about whether data conversion has been performed on the "$upm.dat" file and the corresponding conversion interval used.

- The "$cs.dat" file contains information about the positions of the Status Change data packets in the "$upm.dat" file.

- The "$midasci.dat" file contains information about the exercise's starting time, ending time, and the vehicle IDs used for data filtering.

- The "event.dat" file stores all the master events entered by the user by running the UPAS Master Event Module.

Appendix C

UPAS Executable Files

The UPAS directory,"\upm", contains all the executable files used by UPAS. The executable files are listed and briefly described in the table below.

TABLE C-1.   NAMES AND DESCRIPTIONS FOR UPAS EXECUTABLE FILES

File Name	Description
bflow.exe	Battle Flow Module
cntmea.exe	Control Measure Module
dell.exe	Used for clearing UPAS database files prior to data conversion
edpms.exe	Performance Measurement Edit Module
extml.exe	Exercise Timeline Module
g_editor.exe	Graph Editor Module
graph.exe	Graph Display Module
index.exe	Index File Creation Module
logo.exe	UPAS Logo Display Module
mel.exe	Master Event List Module
ntc.exe	Data Conversion Module
ntexted.exe	Table Editor Module
ntextev.exe	Table Display Module
plot.exe	Graph Plotting Module
plt.exe	Platoon Organization Module
pms.exe	Performance Measurement Display Module
prepms.exe	Performance Measurement Pre-data Entry Module
sdp.exe	Set Data Path Module
sshot.exe	Battle Snapshot Module
super.exe	UPAS Main Module
upf.exe	Data Collection Module
upm.bat	Batch file to load/unload xdb engine and invoke UPAS
viewpdu.exe	View PDU Module
viewplan.exe	Planview Module